STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Illinois Bell Telephone Company	)	
	)	**02-0864**
Filing to increase Unbundled Loop	)	
and Nonrecurring Rates	)	

*** PUBLIC VERSION ***

DIRECT TESTIMONY OF

BRIAN F. PITKIN

AND

STEVEN E. TURNER

ON BEHALF OF

AT&T COMMUNICATIONS OF ILLINOIS, INC.

AT&T EX. 2.0

MAY 6, 2003

1   **SUBJECT INDEX**

21   **Attachments**

22   Attachment BFP/SET-1:   Qualifications and Experience of Brian F. Pitkin

23   Attachment BFP/SET-2:   Electronic Attachments and Workpapers (Proprietary)

24   Attachment BFP/SET-3:   JAMS Documentation (Proprietary)

25   Attachment BFP/SET-4:   Bottom-Up Input Development and JAMS Calculations (Proprietary)

26   Attachment BFP/SET-5:   SBC Project Pronto DLC Information (Proprietary)

27   Attachment BFP/SET-6:   JAMS Estimator Reports for Digital Loop Carrier Systems (Proprietary)

28   Attachment BFP/SET-7:   JAMS Underlying Digital Loop Carrier Tables (Proprietary)

29   Attachment BFP/SET-8:   Detailed Digital Loop Carrier Source Comparison (Proprietary)

30   Attachment BFP/SET-9:   SBC Loop Count from SBC's Fill Factor Development (Proprietary)

31   Attachment BFP/SET-10:   SBC Loop Deployment Guidelines (Proprietary)

1   Attachment BFP/SET-11:   Mix of Distribution and Feeder Cable By Structure Type and Zone

2   Attachment BFP/SET-12:   Amendment Number 3 to the Alcatel Purchasing Agreement (Proprietary)

I.   INTRODUCTION

Q.   PLEASE STATE YOUR NAMES AND BUSINESS ADDRESSES.

A.   My name is Brian F. Pitkin. I am President of InterLink, Inc., a financial and economic consulting firm specializing in telecommunications. My business address is InterLink, Inc., 4824 Birch Lane, Alexandria, Virginia 223132.

My name is Steven E. Turner. I head my own telecommunications and financial consulting firm, Kaleo Consulting. My business address is Kaleo Consulting, 2031 Gold Leaf Parkway, Canton, Georgia 30114. I am concurrently filing testimony addressing SBC's non-recurring cost studies in this proceeding.

Q.   MR. PITKIN, PLEASE DESCRIBE YOUR EDUCATION AND EMPLOYMENT HISTORY.

A.   After graduation from the University of Virginia, I joined Peterson Consulting, L.P., where I was involved in developing and analyzing large databases and performing economic analyses. In 1994 I joined Klick, Kent & Allen, Inc. (which was subsequently acquired by FTI Consulting). Since that time, I have been involved in cost analyses for the telecommunications, railroad, pipeline and postal industries. Many of the analyses I have worked on have been submitted in regulatory and court proceedings. Most recently, I formed InterLink, Inc.

1   During the past six years, I have had extensive experience with the cost models and

2   underlying databases that have been submitted in proceedings arising out of the

3   Telecommunications Act of 1996 ("1996 Act"). In this time, I have become familiar with

4   virtually every major forward-looking cost model submitted in state and federal

5   proceedings for estimating costs of (1) unbundled network elements ("UNEs") for

6   interconnection, (2) basic local service for universal service fund ("USF") requirements,

7   and (3) access services.

8   Specifically, I have reviewed the Benchmark Cost Model ("BCM"), the Benchmark Cost

9   Proxy Model ("BCPM"), the Hatfield Model (now the Hatfield Associates, Inc or "HAI"

10   Model), the Integrated Cost Model ("ICM"), various BellSouth models (including its loop

11   model), the Hybrid Cost Proxy Model ("HCPM"), and the Federal Communications

12   Commission's ("FCC's") Synthesis Model adopted in the FCC's Platform Order.

13   In addition, I have reviewed numerous cost studies submitted by both rural and non-rural

14   incumbent local exchange carriers ("ILECs") as part of regulatory proceedings and

15   commercial litigation over a number of years. Most recently, I reviewed SBC's new loop

16   cost study, or LoopCAT, and filed testimony on this cost study in the recent California

17   UNE proceeding, CPUC Docket A.01 02 024 et al.

18   Attachment BFP/SET-1 to this testimony provides further detail concerning my

19   qualifications and experience.

1   **Q.   MR. TURNER, PLEASE DESCRIBE YOUR EDUCATION AND EMPLOYMENT**

2   **HISTORY.**

3   A.   A description of my education and employment is included in my testimony on non-

4   recurring costs, which is being filed concurrent with this testimony. My Attachment

5   SET-1 to that testimony provides further detail concerning my qualifications and

6   experience.

7   **Q.   PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.**

8   A.   The purpose of our testimony is to review the cost studies filed by SBC Illinois (hereafter

9   "SBC" or "SBC Illinois") in ten areas: (1) 2-wire analog loops; (2) 4-wire analog loops;

10   (3) BRI loops; (4) coin loops; (5) DS-1 loops;(6) ground start loops; (7) EKL loops; (8)

11   2W xDSL compatible loops; (9) 4W xDSL compatible loops, and (10) DS-3 loops. In

12   particular, our testimony focuses on SBC's Loop Cost Analysis Tool ("LoopCAT"),

13   which SBC Illinois uses to calculate loop-related investments. As part of our analysis,

14   we have performed many analyses and calculations, many of which are voluminous and

15   best reviewed in electronic format. We have provided, as Attachment BFP/SET-2, an

16   electronic copy of all backup documentation and material supporting our testimony and

17   revisions to SBC's cost studies. This Attachment also includes all of the discovery

18   responses we rely on in our testimony.

19   We have, however, coordinated our analysis with that of other witnesses for AT&T

20   Communications of Illinois, Inc. ("AT&T"), including Steven E. Turner (nonrecurring

21   costs), Terry L. Murray (cost of capital), Michael J. Majoros (economic lives), Robert P.

1   Flappan (labor rates), Michael Starkey and Warren R. Fischer (cost study factors), and

2   Joseph Gillan (policy matters and results presentation). Our testimony, in combination

3   with those of these other witnesses, addresses all aspects of loop costs.

4   **Q.   PLEASE DESCRIBE THE STRUCTURE OF YOUR TESTIMONY.**

5   A.   Our testimony is structured into four sections. In Section I, we provide an introduction to

6   our testimony and give a brief overview of the LoopCAT costing process. In Section II,

7   we illustrate that the cost results propounded by SBC in this proceeding do not reflect

8   forward looking unbundled costs as required by TELRIC because SBC's studies

9   overstate the loop costs. In Section III, we detail the minimum adjustments that are

10   necessary to produce UNE rates that are more TELRIC compliant than those sponsored

11   by SBC, which are not TELRIC compliant. In Section IV, we summarize our testimony

12   and present our conclusions.

13   **Q.   BEFORE BEGINNING YOUR ANALYSIS, PLEASE DESCRIBE HOW THE**

14   **LOOPCAT WORKS.**

15   A.   LoopCAT uses the costs of nine main components of the telecommunications network

16   infrastructure to develop the average cost of loops in each rate zone. At a high level,

17   these nine components of the unbundled loop correspond to physical portions of an

18   unbundled loop as one moves from a customer premises to the central office. These

19   components are:

20   • **Premises Termination** – includes the network interface device
21   ("NID"), the block terminal, and the drop wire components. The NID
22   is the equipment that serves as the point of demarcation between the
23   ILEC's cable facilities and the customer premises. For large buildings,

1   a block terminal serves the same function as a NID. The telephone
2   wiring inside of the customer premises terminates on one side and the
3   ILEC's cable facilities terminate on the other side of this demarcation
4   point (either the NID or block terminal). In the homeowners' context,
5   the drop wire is the aerial or buried wire that runs across a residential
6   property from SBC's network. It is normally less than 100 feet in
7   length.

8   • **Distribution Terminal** – provides an outside termination for the
9   distribution cable. Drop wire is connected to screw down lugs in the
10   distribution terminal.

11   • **Distribution Cable** – is the black jacketed outside plant cable that
12   runs past virtually every household in SBC's territory. It connects the
13   distribution terminal to the feeder distribution interface ("FDI") where
14   individual pairs are cross-connected to the feeder plant. This plant
15   category includes twisted copper pair telephone cable and all of the
16   structure (such as poles, trenches and conduit) required to support that
17   copper cable;

18   • **Feeder Distribution Interface** ("FDI") – provides a manual cross-
19   connection point between the pairs of distribution cable, described
20   above, and the pairs of feeder cable. The FDI provides the ILEC some
21   flexibility in provisioning copper cables by allowing it to connect any
22   feeder pair to any distribution pair;

23   • **Copper Feeder Cable** – in combination with copper distribution is
24   only used in SBC's LoopCAT network for loops that have a total
25   length (from the central office to the distribution terminal) of 12,000
26   feet or less. Copper feeder plant also requires supporting structure,
27   and in a forward-looking environment it can use some of the same
28   structure required to support distribution cable;

29   • **Feeder Stub Cable** – is a portion of feeder plant that is used to
30   connect a digital loop carrier (served from fiber feeder cable) to
31   multiple feeder distribution areas only when multiple distribution areas
32   are served from a single digital loop carrier;

33   • **Digital Loop Carrier ("DLC")** – converts the signals that are carried
34   across the copper distribution cable into a format that can be
35   transmitted across fiber. The use of DLC systems in the feeder route
36   also allows for efficiencies resulting from self-monitoring and remote

1   provisioning. DLC technology is available in two forms, integrated
2   DLC ("IDLC") and universal DLC ("UDLC"). IDLC converts analog
3   signals from copper distribution pairs to a digital format that can then
4   be fed directly into the network or telephone switch. UDLC converts
5   analog signals from copper distribution pairs to a digital format at the
6   DLC remote terminal ("DLC-RT") and reconverts those digital signals
7   back to a analog format in the central office. Those circuits are then
8   converted from copper-based analog form to a digital form before
9   being transmitted over the network, or are converted to a digital form
10   at the analog line port of the telephone switch;

11   • **Fiber Feeder Cable** – is used (in conjunction with DLCs) for loops
12   that exceed a total length of 12,000 feet between the central office and
13   the distribution terminal. It also requires supporting structure; and

14   • **Main Distribution Frame ("MDF")** – is the location within the
15   central office where all copper feeder pairs are terminated. Fiber
16   feeder strands are terminated on a fiber distribution frame ("FDF")
17   before being cross-connected and cabled to a DLC central office
18   terminal ("DLC-COT").

19   **Q.   HOW DOES LOOPCAT PROCESS ALL THE COST COMPONENTS?**

20   A.   As previously stated, the SBC version of LoopCAT uses all the above cost components to

21   develop the average cost of loops. LoopCAT is controlled by Microsoft Visual Basic

22   code that processes each rate zone. It performs this function by copying one record of

23   information for each rate zone, and lets the Microsoft Excel spreadsheet perform

24   calculations based on that information record. The resulting information for each of the

25   network components is then copied to another location and saved. This information is

26   then combined with the number of lines and the rate zones to develop a weighted average

27   cost by zone.

1 **II.** **SBC'S METHODOLOGIES PRODUCE OBVIOUSLY INCORRECT INPUTS**
2 **AND RESULTS**

3 **Q.** **HOW DO THE RATES PROPOSED BY SBC IN THIS PROCEEDING**

4 **COMPARE TO THE RATES PREVIOUSLY PROPOSED BY THIS**

5 **COMMISSION?**

6 A. As a threshold matter, SBC has proposed outrageously large increases in UNE prices

7 compared to the current Illinois Commerce Commission ("ICC")-approved UNE prices.

8 For example, SBC's proposed $11.62 2-wire loop price for Zone A is more than four

9 times greater than the current price of $2.59. Such increases simply do not pass a "red

10 face test," as they are offered without any justification whatsoever that could explain why

11 SBC's costs could have risen so much from the forward-looking costs adopted by the

12 ICC just a few years ago in ICC Docket Nos. 96-0486/0569 (consol).

13 **Q.** **WHAT EVIDENCE HAS SBC SUBMITTED TO SHOW THAT COSTS HAVE**

14 **INCREASED SINCE THE COMMISSION'S PRIOR DECISION?**

15 A. Absolutely none. SBC failed to provide any reasonable support for the reversal in loop

16 cost trends that its cost study contemplates.

17 **A.** **Telecommunications Costs are Decreasing, Not Increasing**

18 **Q.** **WHAT INDICATORS CAN THE COMMISSION RELY ON TO EVALUATE**

19 **THE DIRECTION OF TELECOMMUNICATIONS COSTS?**

20 A. There are four primary causes of the cost reductions that have occurred in the

21 telecommunications industry over the past decade, all of which are applicable to SBC.

1   First, the cost of most telecommunications equipment has declined over time. Second,

2   telecommunications carriers are realizing significant efficiency gains as a result of

3   consolidations (merger savings and improved purchasing power). SBC has been on the

4   forefront of such consolidation, having closed its merger with Ameritech in October of

5   1999, after having merged with Pacific Telesis (PacBell) and, before that, Southern New

6   England Telephone. Third, technological advancements available to SBC and other

7   incumbents have lowered the operational expenses, such as maintenance and

8   provisioning. Fourth, growth in overall demand for the full scope of services offered by

9   SBC over its network has contributed to significant reductions in the per-unit costs of

10   shared facilities and infrastructure. The combined effect of these trends has been a

11   significant reduction in the forward-looking costs of providing local telecommunications

12   services. As discussed below, SBC has certainly not been immune to any of these

13   declining cost factors.

14 **Q.**   **WHAT EVIDENCE SUPPORTS THE COST DECLINES FOR INPUTS USED TO**

15   **CONSTRUCT THE LOCAL TELECOMMUNICATIONS NETWORK**

16   **INFRASTRUCTURE?**

17 A.   Recent telecommunications trade press, the FCC and the courts have all identified the

18   significant reductions in equipment prices that have occurred over the past several years.

1   Industry trade publications such as Broadband Week have commented on this: "There is

2   no denying the downward trend of equipment prices, ranging from sophisticated

3   switching gear to fiber optic cable."[1]   Similarly, incumbent LEC executives have touted

4   their success in achieving large price declines. For example, Joseph Nacchio, former

5   chief executive of Qwest Communications International, stated the following in a May

6   2001 conference call with analysts: "We've been able to take advantage of an

7   extraordinarily favorable pricing environment from our suppliers who are scrambling for

8   every dollar they can get." As Mr. Nacchio further explained: "We're just pressing

9   vendors across the board--whether it's optics, DSL, adding switched ports or software

10   releases. It's become a buyer's market and we're taking advantage."[2]

11   Furthermore, the FCC and the courts have also recognized these cost declines. For

12   example, the D.C. Circuit recently remarked that "[i]n a market with falling costs, ancient

13   UNE rates cannot serve as a valid benchmark."[3]   Further, as part of its efforts to

14   determine inputs for the FCC's Synthesis Model, the FCC noted that "US West agrees

15   that the costs of the equipment, such as switches and multiplexers, used to provide

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[1] *Broadband Week*, "Equipment Prices Dropping, But Not Plummeting," Ken Branson, June 4, 2001, included as "DeclineCostDocs.pdf" in Attachment BFP/SET-2.

[2] *CNET News.com*, "Telecoms Anticipate Price Cuts for Gear," Wylie Wong and Sam Ames, May 25, 2001, included as "DeclineCostDocs.pdf" in Attachment BFP/SET-2.

[3] *WorldCom, Inc. v. FCC*, No. 01-1198, 2002 WL 31360443, *4 (D.C. Cir., September 9, 2002).

1   telecommunications services are declining, and that the per-unit cost of providing more

2   services on average is declining."[4] In fact, in a previous order, the FCC explicitly sought

3   to ensure that anticipated cost declines would be reflected in determining regulated rates:

4   Additionally, to ensure that customers continue to receive the
5   benefits of access reform, any plan, whether through restructuring
6   access rates or moving implicit universal service support into the
7   universal service fund, should include an aggressive mechanism
8   that would reduce rates or support over time, reflecting the
9   continually declining costs of the telecommunications industry.[5]

10   **Q.   HOW HAS SBC REALIZED SAVINGS AND OTHER BENEFITS FROM ITS**

11   **MERGERS?**

12   A.   SBC has benefited extensively from the second factor that has lowered

13   telecommunications costs: merger-related savings and efficiency gains (such as

14   improved purchasing power). SBC itself claimed that its mergers would generate

15   efficiencies in the development, production and/or distribution of goods and services.

16   Since 1995, the local exchange market has observed significant consolidation, with the

17   merger of the seven "Baby Bell" incumbents into four dominant incumbents (Verizon,

18   SBC, BellSouth and Qwest) that serve more than 93 percent of the total lines between

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[4] FCC CC Docket No. 96-45 & No. 97-160, In the Matter of Federal-State Joint Board on Universal Service
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, Tenth Report and Order, October 21,
1999 at ¶ 313.

1   them (as reported to the FCC in ARMIS reports). SBC now serves more than four times

2   the number of lines that Ameritech served in 1996. With this backdrop, it is obvious that

3   SBC has realized significant savings from the mergers of Southwestern Bell

4   Communications, Pacific Telesis, Southern New England Telecommunications and

5   Ameritech.

6   [W]e completed the Ameritech transaction just a few weeks ago,
7   but we are well along in developing the business plans that will
8   bring you and our customers the full value of this powerful
9   combination. Using the same processes that guided our successful
10   integration of Pacific Telesis and Southern New England
11   Telecommunications, we are confident that we can achieve our
12   goal of $1.4 billion in synergies by 2002.[6]

13   The accompanying testimony of Michael Starkey and Warren R. Fischer discusses the

14   issue of SBC's merger savings in more detail and demonstrates that SBC's Illinois cost

15   studies fail to account for merger-related savings in any meaningful way.

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[5] FCC CC Docket No. 96-45, Second Recommended Decision, November 23, 1998, Joint Statement of Chairman Julia L. Johnson and Commissioner David Baker, page 2.

[6] SBC Communications Inc.'s Quarterly Report to Shareholders, 3rd Quarter 1999. The $1.4 billion cited in the above quotation can also be found in the FCC *Memorandum Opinion and Order In re Applications of Ameritech Corp and SBC Communications* at ¶ 324. In its 3rd Quarter 1999 Report to Shareholders, SBC noted that the largest anticipated merger cost savings would come from support operations, such as volume discounts on equipment purchases ($381 million) and consolidation of billing and ordering functions ($227 million). In addition, SBC/Ameritech predicted more than $310 million in savings from combining their operations.

1   Q.   **HOW HAS SBC BENEFITED FROM TECHNOLOGICAL ADVANCEMENTS IN**

2   **THE FORM OF LOWER OPERATIONAL EXPENSES OF MAINTAINING THE**

3   **NETWORK AND PROVISIONING SERVICES?**

4   A.   The tremendous technological advancements are evident from SBC's wide-scale

5   deployment of advanced technologies throughout its network. With respect to these

6   projects, SBC has repeatedly touted the savings that it will realize from implementing

7   Project Pronto:

8   [T]he Ameritech acquisition has enabled us to launch an
9   unprecedented $6 billion initiative designed to transform our
10   company over the next three years into America's largest single
11   provider of advanced broadband services. Ultimately, we intend to
12   make broadband available to all of our customers. This initiative,
13   which we call Project Pronto, gets us most of the way there, with a
14   goal of offering some 80 percent of our customers always-on,
15   high-speed voice, data and video transmission via Digital
16   Subscriber Line (DSL) by the end of 2002. We also plan to
17   enhance our network to accelerate the rollout of high-speed data
18   technologies, while simultaneously reducing our network cost
19   structure. The resulting expense and capital savings alone are
20   expected to offset the cost of the entire initiative.[7]

21   In fact, SBC stated that "[T]he efficiencies SBC expects to gain will pay for the cost of

22   the [Project Pronto] deployment on an NPV [Net Present Value] basis. These efficiencies

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[7] SBC Communications Inc.'s Quarterly Report to Shareholders, 3rd Quarter 1999.

1   are conservatively targeted to yield annual savings of about $1.5 billion by 2004,"[8] and

2   SBC provided examples of how those efficiencies would be realized:

3   By avoiding dispatches on many installations, SBC expects to
4   realize efficiencies in its installation and maintenance operations.
5   Other anticipated efficiencies will come from reduced activity
6   required in the remaining copper plant because of improved
7   reliability.

8   Reduced spending on feeder facilities represents 70 percent of the
9   targeted capital savings. The broad deployment of fiber and
10   related electronics will substantially eliminate further deployment
11   of copper facilities for feeder reinforcement.[9]

12   Clearly, if SBC can economically validate the savings from implementing Project Pronto

13   (to its shareholders and the financial markets), it is logical that such savings should be

14   reflected in a forward-looking cost study of SBC's local exchange network designed to

15   establish the prices for UNEs. Such savings, if properly accounted for in a TELRIC-

16   compliant UNE cost study, would drive down TELRIC costs and associated UNE prices.

17   **Q. HAS GROWTH IN OVERALL NETWORK DEMAND FOR THE SERVICES**

18   **OFFERED BY SBC CONTRIBUTED TO SIGNIFICANT REDUCTIONS IN THE**

19   **UNIT COSTS?**

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[8] SBC Communications Inc.'s Investor Briefing, October 18, 1999.

[9] *Id.*

1   A.   Yes. In addition to the cost reductions that have occurred recently, SBC Illinois' network

2   has observed significant growth in demand, which further reduces the per-unit cost of

3   network elements. SBC Illinois' total demand has grown from 7.66 million to 10.2

4   million total lines between 1996 and 2002, a growth of 33.6 percent. In addition to the

5   raw increase in lines, SBC Illinois has experienced a great increase in demand for the

6   different services that can be provided over its network, thereby further driving down per

7   unit costs. Because all of the services SBC Illinois offers are provided over some amount

8   of shared facilities, this increase in demand results in a lower cost per unit of demand, as

9   more demand is available to cover common and fixed costs. For example, the poles used

10   to provide plain old telephone service ("POTS") are the same poles that are used to

11   support higher capacity services such as DS-1, DS-3, and optical services. Moreover, the

12   fiber optic facilities and digital loop carrier systems that support POTS services also

13   support DS-1 services and Project Pronto data services (*e.g.*, DSL). In fact, in the first

14   quarter of 2003, SBC reported its "best ever" quarterly growth in DSL lines, culminating

15   in a 60% increase in DSL subscriptions over the last year.[10] In other words, the forward-

16   looking network consists of one set of facilities that is used to provide the full range of

17   services that SBC Illinois offers. Given that many of SBC Illinois' services are growing

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[10] SBC Communications Inc., Investor Briefing, April 14, 2003, p. 8. SBC also reported an eight percent
penetration of DSL subscriptions within its service territory, the highest ever reported. SBC further touted the recent
(continued)

1   at very high rates, the per-unit cost of the joint and common facilities used in providing

2   these services is declining significantly over time.

3 **Q.   WHAT IS SBC'S NORMAL COURSE OF BUSINESS OUTLOOK FOR**

4 **TELECOMMUNICATIONS COSTS?**

5 A.   SBC expects cost declines to continue. In an August 22, 2002 "Analyst Comment" that

6   SBC attached to a September 9, 2002 "Memorandum of Ex Parte Presentation" from

7   Brian J. Bennison (SBC's Associate Director, Federal Regulatory) to the FCC, as part of

8   the FCC's Triennial Review[11], Goldman Sachs cites SBC's CFO Randall Stephenson in

9   observing:

10   SBC sees the margin difference between it and VZ and BLS as
11   indicating an opportunity for further cost cutting. Pointing to
12   opportunities in consolidating call centers, raising efficiencies in
13   network operations and generally trimming overhead costs.

14   Thus, we agree with SBC that its costs should continue to decline. However, SBC has

15   failed to reflect these declines in its cost studies.

release of its PremierSERV product, which targets the data needs of small to medium size businesses.

[11] CC Docket No. 01-338, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers; CC Docket No. 96-98, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; and CC Docket No. 98-147, Deployment of Wireline Services Offering Advanced Telecommunications Capability.

1 **Q.** **HAVE REGULATORY DECISIONS GENERALLY RECOGNIZED THE**

2 **DECLINING COST NATURE OF THE TELECOMMUNICATIONS INDUSTRY?**

3 A. Yes. The table below shows the outcome of several regulatory decisions in 2002 and

4 2003 related to UNE-P costs in several key states. The results show that, for a typical

5 residential UNE-P customer, the reductions have been as high as 60%. The column

6 labeled "New Average Platform (w/NRC)" also shows that Illinois UNE-P pricing is by

7 no means out of line with that in many other states. Additionally, we are aware of no

8 instance where UNE-P rates have increased in a recent regulatory proceeding. This

9 comparison shows that UNE rates are declining over time, consistent with the fact that

10 telecommunications is a declining cost industry.[12]

11

_____

[12] SBC asserts that current Illinois UNE prices are too low, comparing Illinois rate levels with those in other non-Ameritech states. Interestingly, SBC itself identifies one of the key reasons that Illinois prices (particularly loop prices) are lower than those in other states. In a Texas filing, SBC explains "the fact that Texas is different from those [other] states in many ways - - in loop characteristics, rate of buried plant, fill factors and geography. The Midwestern Ameritech states, for example, have a population density that is an average of 223% more dense than Texas's (in population per square mile), while California is 277% more dense. This is highly important because, as the FCC observed in its TELRIC rulemaking, there is a 'strong (negative) correlation between population density and the loop costs reported by all the cost models.'" SBC Texas goes on to dispute the correctness of the rates in the Ameritech states but notes that "it is no surprise that one might find lower UNE rates in states that are so much more dense than Texas." (Emphasis in original, footnote eliminated). In an accompanying footnote SBC Texas notes that Illinois is 285% more dense than Texas. SBC's Response to the CLECs' Motions for Reconsideration of Abatement Order, Public Utility Commission of Texas, Docket No. 25834, pp. 8-9, footnote 9 (April 17, 2003). *See,* "Texas CLEC Motion.pdf" in Attachment BFP/SET-2.

1   **Figure 1**

2   **UNE-P Rate Changes**

3   **(Residential UNE-P Customer)**

State	Old Average Platform (w/NRC)	New Average Platform (w/NRC)	Reduction	Percent Reduction
California	$21.24	$13.33	$7.91	37%
Illinois	$15.91	$13.40	$2.51	16%
Indiana	$17.88	$12.24	$5.64	32%
Michigan	$13.92	$13.92	$0.00	0%
New Jersey	$26.53	$14.27	$12.26	46%
New York	$26.14	$18.34	$7.80	30%
Ohio	$15.51	$13.60	$1.91	12%
Washington DC	$16.56	$6.60	$9.96	60%
Wisconsin	$21.00	$15.46	$5.54	26%

4

5   **Q.   IN LIGHT OF THIS EVIDENCE OF DECREASING COSTS, HOW CAN SBC BE**

6   **PROPOSING INCREASING COSTS?**

7   A.   Based on this evidence, SBC cannot legitimately claim that its forward-looking costs

8   have risen. On that basis alone, its cost studies lack any legitimacy. Moreover, it is

9   extremely difficult to identify and quantify the reasons that SBC's new loop cost studies

10   produce such anomalous results as compared to the results of its prior cost studies. SBC

11   has completely discarded the loop cost study methodology that Ameritech previously

12   endorsed---and which was accepted by the ICC--preventing the parties from readily

1   comparing input values over time and identifying what causes the huge increase in loop

2   costs. SBC's strategic decision to file new cost studies has required AT&T to closely

3   scrutinize the investment portion[13] of SBC's new unbundled loop cost studies to identify

4   the erroneous assumptions and inputs that drive such high loop costs. Below, we

5   summarize our findings concerning the LoopCAT studies.

6   **B.   <u>SBC's Methodologies Are Obviously Flawed</u>**

7   **Q.   IN ADDITION TO PROPOSING INCREASED COSTS THAT ARE**

8   **CONTRADICTORY TO INDUSTRY TRENDS OF DECLINING COSTS, WHAT**

9   **OTHER EVIDENCE SHOWS THAT THE COST STUDIES PROPOSED BY SBC**

10   **ARE UNRELIABLE AND SERVE TO INFLATE COSTS?**

11 A.   SBC's LoopCAT study is plagued with problems that make it unreliable for estimating

12   forward-looking economic costs. We have identified a number of fundamental flaws,

13   which we discuss below. Section III of our testimony lays out, in detail, how we

14   modified SBC's cost studies to reflect forward-looking costs that adhere more closely to

15   Total Element Long Run Incremental Cost ("TELRIC") standards.

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[13] The expense portions of SBC's new unbundled loop cost studies are addressed by Messrs. Starkey and Fischer in their analysis of SBC's annual cost factors ("ACFs") and other cost factors.

1   **Q.   CAN YOU SUMMARIZE SOME OF THE PROBLEMS INHERENT IN**

2   **LOOPCAT?**

3   A.   Yes. The first of problems we have identified in LoopCAT is that, in many instances, it

4   provides results that are simply inexplicable. In summary:

5   •   LoopCAT incorrectly generates investments for premises termination that are approximately

6   *****BEGIN PROPRIETARY   END PROPRIETARY ***** percent of the investments in

7   distribution cable *and* associated structure, even though premises termination investments

8   should be a much smaller overall portion of investment than is distribution cable;[14]

9   •   LoopCAT incorrectly calculates the economically efficient point at which 100% copper loops

10   should be replaced with fiber/copper combinations;

11   •   LoopCAT makes incorrect assumptions regarding second-line penetration, inexplicably

12   assuming a higher level of second-line penetration in rural areas than in suburban areas;

13   •   LoopCAT improperly uses fill factors that are higher in rural areas than urban areas;

14   •   LoopCAT does not reflect economies of scale – for example, it produces ***** BEGIN**

15   **PROPRIETARY   % lower END PROPRIETARY ***** costs for buying and installing two

16   2,700 pair feeder distribution interfaces ("FDIs") than it does for buying and installing one

17   5,400 pair FDI; and

18   •   LoopCAT substantially overstates the cost of high-capacity services by multiplying the costs

19   per service by the DS0 capacity of those services.

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[14] Specifically, SBC has filed LoopCAT studies with premises termination investments totaling approximately ***** BEGIN PROPRIETARY   END PROPRIETARY *****. This compares with SBC's development of approximately ***** BEGIN PROPRIETARY   END PROPRIETARY ***** in distribution investment. In other words, SBC inexplicably develops premises termination investments that are approximately *****BEGIN PROPRIETARY   % ***END PROPRIETARY ***** of distribution cable and associated structure. The analysis supporting these calculations is contained in the directory titled "Premise Termination." *See,* "IL 2w Analog LoopCAT 02-05_Prem Term.xls" in Attachment BFP/SET-2.

1   Further, the various LoopCAT studies sponsored by SBC have a number of additional

2   *factual* errors, including the following:

3   • LoopCAT incorrectly assumes that PBX systems (which are owned and used by
4   businesses) have NIDs and terminate at residences;

5   • LoopCAT incorrectly assumes that coin loops have six-pair NIDs and terminate at
6   residences;

7   • LoopCAT incorrectly assumes that 4-Wire Analog loops (which are almost exclusively
8   used by businesses) terminate the majority of the time at residences;

9   • LoopCAT incorrectly assumes that BRI and DS-1 loops should have the common DLC
10   system investment allocated based on Voice Grade Equivalents ("VGEs") rather than the
11   cost-causative space occupied in the remote terminal frame;

12   • LoopCAT incorrectly assumes that DS-1 loop lengths, which are generally concentrated
13   in business districts near the wire center, are the same as general 2-wire analog loops;

14   • LoopCAT incorrectly assumes that EKL loops serve residential customers while these
15   loops actually serve business customers;[15] and

16   • SBC inexplicably chose not to study controlled environmental vaults ("CEVs") in
17   designing its LoopCAT study for Illinois even though it incorporated this functionality in
18   the recent California TELRIC proceeding.

19   Finally, the SBC loop cost study in this proceeding continues to include errors and

20   omissions that SBC has previously conceded in other proceedings should be corrected.

21   Specifically:

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[15] *See,* http://www05.sbc.com/ucontent/1,,60,00.html for a description of SBC's EKL service for business
customers, included as "EKLhtml" in Attachment BFP/SET-2.

1   • LoopCAT continues to use the admittedly wrong fill factor for FDIs;

2   • LoopCAT continues to fail to account for efficiencies inherent in serving multiple

3   dwelling units, such as apartment complexes and condominiums, in estimating loop

4   costs;

5   • LoopCAT continues to fail to use proper termination equipment for Coin, BRI and PBX;

6   and

7   • LoopCAT continues to admittedly overstate the installed cost of DLC equipment by

8   nearly 82% as compared to recent statements by SBC witnesses in the Texas TELRIC

9   proceeding.[16]

10   In sum, the LoopCAT, as presented by SBC, is not TELRIC compliant, and is otherwise

11   riddled with readily identifiable factual errors. Both of these problems result in

12   drastically overstated loop costs, and must be remedied if the Commission is to use

13   LoopCAT in setting UNE prices.

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[16] LoopCAT assumes ***** BEGIN PROPRIETARY   END PROPRIETARY ***** for a Litespan 2016 cabinet (LoopCAT, cell I13 of sheet DLC_RT_Cabinets) while SBC witness Mr. John Trott revealed that the total installed cost ranges from ***** BEGIN PROPRIETARY**   to   **END PROPRIETARY *****. Deposition of John C. Trott, March 20, 2003, Public Utility Commission of Texas Project No. 25834, Proceeding on Cost Issues Severed From PUC Docket No. 24542 (hereafter "*Trott Texas Deposition*"), March 20, 2003, at 158. *See,* "Trott Deposition TX .pdf" in Attachment BFP/SET-2.

1 III. **NECESSARY ADJUSTMENTS TO THE LOOPCAT COST STUDIES FILED BY**
2   **SBC**

3 Q. **GIVEN THE ABOVE LIMITATIONS, DO THE COST STUDIES PROPOUNDED**

4   **BY SBC COMPLY WITH THE FCC'S FORWARD-LOOKING COSTING**

5   **PRINCIPLES?**

6 A. No. Our investigation reveals that SBC's loop cost studies are fundamentally and widely

7   inconsistent with the TELRIC principles articulated by the FCC and adopted by the

8   Illinois Commerce Commission in various proceedings, including Dockets 96-0486/0569

9   (Consol.), Docket 98-0396, Docket 00-0700 et al.[17]

10 Q. **BEFORE DESCRIBING THOSE PROBLEMS IN DETAIL, CAN YOU PLEASE**

11   **SUMMARIZE THE MOST SIGNIFICANT VIOLATIONS OF THE TELRIC**

12   **PRINCIPLES IN SBC'S COST STUDIES?**

13 A. Yes. Among the most significant violations of TELRIC principles are the following

14   errors:

15   • **SBC fails to reflect efficient sizing of facilities**. SBC uses its embedded plant records to
16   determine the equipment sizing assumed in LoopCAT. By failing to reflect the fact that
17   today's demand can be served by larger pieces of equipment (such as cable, DLC

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[17] Various other AT&T witnesses' testimony further addresses SBC's failure to adhere to the FCC's TELRIC
standards and this Commission's rulings.

1   terminals and FDIs) that would be available on a forward-looking basis, SBC has failed
2   to properly reflect economies of scale.

3   • **LoopCAT cannot determine efficient distribution areas**. LoopCAT groups customer
4   locations into the embedded SBC distribution areas ("DAs"). Because LoopCAT "locks
5   in" these embedded DA assignments, it cannot reflect the more efficient groupings that
6   would be possible if SBC redeployed its distribution plant given current customer
7   locations and technologies – just as the TELRIC methodology demands.

8   • **LoopCAT cannot determine efficient FDI locations**. LoopCAT does not place FDIs
9   based on efficient forward-looking engineering principles, but simply uses SBC's
10   embedded locations for FDIs. Because LoopCAT provides no mechanism to alter FDI
11   placement, the cable distance overstatements created by this problem (coupled with the
12   sizing inefficiencies discussed above) cannot be corrected.

13   • **SBC applies a one-size-fits-all approach in determining feeder stub cable distance**.
14   SBC employs a single feeder stub[18] cable distance and applies this distance to every FDI
15   location in Illinois that is being served by a DLC (many of which are not served by DLC
16   today). Relying on embedded distances that do not account for the spatial relationship of
17   the distribution areas to which they are being applied fails to account for the efficient,
18   forward-looking network configurations, thereby violating TELRIC principles in favor of
19   SBC's existing embedded network.

20   • **SBC's cable inputs represent embedded, antiquated, inefficient multiple cables**
21   **when a single larger cable would suffice and be more efficient**. SBC bases all of its
22   LoopCAT cable costs on the embedded base of cables, which are smaller and therefore
23   higher cost than efficiently sized forward-looking cables.

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[18] As noted, feeder stub connects DLCs to FDIs.

1 • **SBC fails to reflect forward-looking outside plant routing**. LoopCAT is designed to
2 calculate investments based on "actual" cable lengths from SBC's internal records.
3 These cable length records reflect embedded routing from the central office to the
4 customer's premises, rather than the more efficient routing that would be possible in a
5 forward-looking environment. A proper TELRIC methodology would redesign the
6 outside plant routing based on current customer locations and technologies.

7 • **SBC fails to reflect efficient plant mix**. LoopCAT also purports to use SBC's
8 embedded mix of aerial, buried and underground plant. In California, SBC's own
9 engineering witness admitted that this mix differs from the plant mix that SBC would
10 build today if it were to build its network anew.[19] Moreover, SBC misinterprets its own
11 embedded data and therefore applies it incorrectly in LoopCAT.

12 • **SBC incorrectly calculates the economic crossover for copper or fiber facilities**.
13 SBC uses a single copper/fiber crossover point in its cost study that fails to satisfy the
14 economic breakpoint and prematurely utilizes more expensive fiber facilities.

15 • **SBC's LoopCAT is based on loops that will not physically provide working service**.
16 The simplified logic that SBC used to determine cable gauging in LoopCAT violates both
17 SBC's own engineering guidelines and all economic logic. As a result, LoopCAT builds
18 costs based on loops that could not even support basic voice-grade service and others that
19 are outrageously over-engineered and gold-plated.

20 • **SBC fails to reflect efficient installation costs**. LoopCAT relies upon a series of
21 "installation factors" to estimate the non-material portion of the total investments for

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[19] Deposition of Cheryl Bash, November 12, 2002, Page 99, Public Utility Commission of the State of California Applications 01-02-035, 02-02-031, 02-02-032, 02-02-034, 02-02-002, Joint Application of AT&T Communications of California, Inc. and WorldCom, Inc., for the Commission to Reexamine the Recurring Costs and Pieces of Unbundled Switching in its First Annual Review of Unbundled Network Element Costs Pursuant to Order Paragraph 11 of D.999-11-050 and Related Cross Applications, p. 99 (hereafter "*Bash California Deposition*"). *See,* "Bash Deposition CA.pdf" in Attachment BFP/SET-2.

1   most network components. These factors are developed from internal SBC databases
2   containing embedded cost data and do not reflect efficient, forward-looking installation
3   costs.

4   • **SBC fails to reflect an efficient scale for construction projects**. Unit costs of
5   construction in LoopCAT are based on SBC's recent experience with its embedded plant,
6   which disproportionately reflects smaller construction projects associated with
7   maintaining and expanding a large network that is already in place. These small projects
8   do not obtain the volume discounts or economies of scale associated with the initial
9   build-out of a network as large as SBC's.

10 • **SBC fails to reflect the provisions of its contracts in developing forward-looking**
11 **costs**. SBC double counts the installation cost of DLCs by using an installed cost of DLC
12 equipment in the material price and then separately including the full amount of
13 installation costs again. Because SBC's vendors provide pre-fabricated DLC equipment,
14 SBC's cost study should not include significant additional installation costs associated
15 with this equipment.

16 • **SBC's LoopCAT fails to account for all services using a single network**
17 **infrastructure**. SBC's cost study covers only a subset of SBC's full range of service
18 offerings and does not reflect the economies achievable by sizing the network to
19 accommodate all services that share many of the same facilities.

20 • **SBC fails to reflect efficient fill factors**. The testimony of Messrs. Starkey and Fischer
21 describes the substantial cost overstatements resulting from SBC's sponsored fill factors.

22 • **SBC fails to reflect its true forward-looking cost of capital**. The testimony of Ms.
23 Murray describes the inflated cost of capital relied on in SBC's cost studies.

24 • **SBC fails to reflect appropriate depreciation lives**. The testimony of Mr. Majoros
25 identifies the correct depreciation lives to be used in SBC's cost studies.

26 • **SBC fails to reflect efficient expenses**. The testimony of Mr. Fischer and Mr. Starkey
27 details the errors in SBC's development of expenses and other cost factors.

28 • **SBC double counts frame investment.** The testimony of Mr. Fischer and Mr. Starkey
29 shows that SBC attempts to recover its frame investment from both its power and
30 common factor and from its separate application of a frame investment in LoopCAT.

1

2   In the testimony that follows, we describe how each of the problems infects SBC's loop cost

3   studies and we explain how we modified LoopCAT to more properly reflect TELRIC costing

4   principles.

5   **A.   INFORMATION RELIED ON FROM OTHER AT&T EXPERTS**

6   **Q.   HAVE YOU RELIED ON THE TESTIMONY OF OTHER AT&T EXPERTS IN**

7   **PREPARING YOUR RESTATEMENTS OF SBC'S LOOPCAT?**

8   A.   Yes. As we previously identified, we rely on a number of witnesses for information and

9   certain inputs that we incorporate into our restatements of LoopCAT. Specifically, we

10   rely on the following categories of information from these witnesses:

11   • Michael Starkey and Warren Fischer: Annual cost factors and loadings;

12   • Robert Flappan: Labor rates;

13   • Michael Majoros: Economic lives;

14   • Terry Murray: Cost of capital;

15   • Michael Starkey: Fill factors; and

16   • Joseph Gillan: Economic policy.

17   **B.   SBC Fails to Reflect Efficient Installation Costs**

18   **Q.   IN WHAT WAYS DOES SBC FAIL TO REFLECT EFFICIENT INSTALLATION**

19   **COSTS?**

20   A.   SBC's LoopCAT does not calculate all construction costs directly. Instead, LoopCAT

21   relies upon a series of "linear loading factors" to estimate the non-material portion of the

1   total investment for most network components (these linear loading factors are

2   sometimes referred to as engineer, furnish, and install ("EF&I") or in-place factors).[20] In

3   simple terms, through LoopCAT, SBC applies these factors to the investment in a

4   particular asset to calculate the construction cost of the asset.

5   In this way, SBC substantially departs from the way that costs are incurred. More

6   notably, SBC's study also ignores the manner in which SBC estimates the costs that it

7   will incur in future projects. In LoopCAT, SBC is advocating the use of controversial

8   "loading factors" which it does not use for any other purpose other than for regulatory

9   cost studies. In contrast, the time increments that AT&T advocates for use in SBC cost

10   studies utilize SBC's own cost estimate tools that, according to SBC, accurately reflect

11   installation costs as an ***** BEGIN PROPRIETARY**

12   **END PROPRIETARY ***** [21] These estimate tools,

13   therefore, are used by SBC's itself when estimating the cost of construction and

14   installation. It is remarkable, therefore, that SBC did not use these internal tools here.

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[20] There are even some instances where SBC estimates the material cost by applying material cost factors to installation *times* (the reverse of applying installation factors to material costs). Our testimony focuses on linear loading factors applied to material investment because the preponderance of SBC's linear loading factors rely on this type of application. However, the same methodological flaws are exhibited in both categories of SBC's linear loading factors.

[21] *See,* SBC Illinois Response to AT&T Data Request BFP-192 at "JAMS OVERVIEW 2003.doc" provided to AT&T on April 10, 2003 and contained in Attachment BFP/SET-3.

1   The Commission should not let SBC substitute improper regulatory inputs simply to

2   artificially inflate the costs of UNEs.

3 **Q.   WHAT IS A LINEAR LOADING FACTOR?**

4 A.   A linear loading factor is a multiplier that is applied to cost data in order to calculate total

5   installed costs based on the assumption that there is a linear, or straight line, relationship

6   between material investment costs and installation costs.   These multipliers are loadings

7   that are applied to material investments in a linear fashion – inappropriately assuming

8   that installation costs are directly proportional to material costs.[22] This methodology

9   builds installation costs from the "top down," by starting, at the top, with total investment

10   and applying loading factors to determine the installation cost.   This approach causes

11   errors in the resulting UNE rates. Such errors are wholly unnecessary given that SBC has

12   readily available systems that estimate installation costs for SBC's operations.   Those

13   SBC systems build installation costs from the bottoms up, by conducting an estimate of

14   the labor time and costs of installation, not by applying confusing "factors" to total

15   investment. The term "bottoms up" means that the cost of the particular element being

16   studied will be determined by its unique attributes (*i.e.*, from the bottom up) rather than

17   by application of a factor.

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[22] Or, in the alternative, assuming that material costs are directly proportional to installation costs.

1 **Q.   ARE SBC'S LOADING FACTORS TELRIC COMPLIANT?**

2 A.   No. Even if you accept the incorrect premise that there is a linear relationship between

3   investment and installation costs (which we do not), SBC's loading factors are not

4   forward-looking and are instead inappropriately reliant on embedded data. In depositions

5   in California, Mr. Smallwood, the SBC Illinois witness sponsoring LoopCAT, confirmed

6   the embedded nature of the linear loading factors relied on in LoopCAT. As Mr.

7   Smallwood explained, those factors were developed from an internal SBC database of

8   embedded data:

9   Q.   BY MR. MILLER: What is the name of the database from
10   which the EF&I loading factors are obtained?

11   A.   It is the -- it's taken from PICS-DCPR data, which, again is the
12   Plug-in Inventory Control System is PICS, and DCPR I believe is
13   Detailed Continuing Property Records.

14   Q.   So PICS is Plug-in Inventory Control System. And DCPR, is
15   what Continuing Property Records?

16   A.   Detailed.

17   Q.   So this information is pulled from two separate databases; is
18   that correct?

19   A.   I believe the data is all one data set.

20   Q.   What is included in these databases?

21   A.   The data that we use from the database is -- the factor is a ratio
22   of total investment to material investment, and that allows us to

1   take material investment and gross it up to a total investment, and

2   that's the data we use from the database.[23]

3   This deposition makes two things clear: (1) that by using Continuing Property Records,

4   the linear loading factors are based entirely on SBC's embedded plant projects, and (2) a

5   simple ratio of total investment to material investment from these Continuing Property

6   Records is used to develop the linear loading factors. It is absolutely impossible for a

7   process that relies exclusively on historical installation relationships to reflect the

8   forward-looking technology and network architecture contemplated in a TELRIC study.

9   By failing to calculate the installation portion of investment directly (*i.e.*, from the

10 bottoms up) and relying instead on embedded linear loading factors, SBC seeks to

11 perpetuate these embedded cost relationships in its forward-looking cost studies.

12 **Q.   CAN YOU GIVE AN EXAMPLE WHY THE USE OF EMBEDDED LOADING**

13 **FACTORS IS NOT FORWARD LOOKING?**

14 A.   Yes. Assume you wanted to build a home. In estimating your forward-looking cost of

15   installation, you would likely determine your project-specific material and labor costs,

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[23] Deposition of James R. Smallwood, November 11, 2002, Public Utility Commission of the State of California Applications 01-02-035, 02-02-031, 02-02-032, 02-02-034, 02-02-002, Joint Application of AT&T Communications of California, Inc. and WorldCom, Inc., for the Commission to Reexamine the Recurring Costs and Pieces of Unbundled Switching in its First Annual Review of Unbundled Network Element Costs Pursuant to Order Paragraph (continued)

1   thereby using a bottoms-up estimate of your installation cost. You likely would not

2   conduct a study to determine the relationship between material and installation costs.

3   And even if you did, you certainly would not determine that relationship by comparing

4   the investment and installation costs of your present (embedded) home, which may have

5   been built in the 1960s based on inefficient construction techniques (plaster walls), dated

6   technology (fuses versus circuit breakers) and out-of-date pricing. Yet that is exactly

7   how SBC determined its loading factors in this case: by comparing investment to

8   installation costs in its embedded network. We discuss this in more detail below.

9   **Q.   WHY IS THE USE OF EMBEDDED LINEAR LOADING FACTORS IN SBC'S**

10   **COST STUDIES WRONG?**

11 A.   There are at least seven problems caused by SBC's reliance on linear loading factors to

12   develop UNE costs:

13   • *Linear loading factors are a black box.* This violates the FCC's requirements
14   that cost studies be open and verifiable[24] and makes it impossible to achieve
15   anything close to information parity among the parties in this proceeding.[25]

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11 of D.999-11-050 and Related Cross Applications, p. 152 (hereafter "*Smallwood California Deposition*"). *See,*
"Smallwood Deposition CA" in Attachment BFP/SET-2.

[24] For example, the FCC's First Report and Order in the Universal Service Proceeding states that: "The cost study or
model and all underlying data, formulae, computations, and software associated with the model must be available to
all interested parties for review and comment. All underlying data should be verifiable, engineering assumptions
reasonable, and outputs plausible." *See*, *In the Matter of Federal-State Joint Board On Universal Service,* First
Report and Order, CC Docket No. 96-45, (rel. May 8, 1997) ¶ 108.

1   •   ***Linear loading factors reflect embedded data.***   The FCC explicitly prohibits the
2   use of embedded data for developing forward-looking costs.[26]   Linear loading
3   factors rely, in their entirety, on SBC's embedded network and activities.

4   •   ***Linear loading factors do not reflect appropriate economies of scale.***   SBC's
5   embedded loading factors reflect smaller projects associated with piece-meal
6   expansions of the network, rather than the much larger projects associated with
7   TELRIC studies in which the entire network is assumed to be constructed.

8   •   ***Linear loading factors are based largely on non-TELRIC activities***.   Much of
9   the capital expenditures included in SBC's linear loading factors include
10   investments associated with replacements and augments instead of new
11   installations.

12   •   ***Linear loading factors are not accurate.***   SBC relies on three year's worth of
13   data for developing its linear loading factors.   This methodology can cause
14   significant errors based on the mismatch in timing between when labor hours are
15   spent and equipment is actually purchased.

16   •   ***Linear loading factors distort de-averaged UNE costs.***   Linear loading factors
17   overstate the cost of installation activities in higher density zones because they
18   assume that installation costs are a function of the material costs and denser
19   regions will utilize larger, more expensive equipment.   Although larger pieces of
20   equipment cost more than smaller pieces of equipment, installation costs are not
21   proportionately larger for large pieces of equipment.   The use of linear loading
22   factors results in significant overstatements in installation costs for those larger
23   equipment sizes (*e.g.*, it costs about the same to place a 2400-pair copper cable as
24   it does to place a 1200-pair copper cable).[27]

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[25] "Given the likely asymmetry of information regarding network costs, we conclude that, in the arbitration process, incumbent LECs shall have the burden to prove the specific nature and magnitude of these forward-looking common costs." *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, CC Docket No. 96-98 (rel. August 8, 1996), ¶ 695 ("Local Competition Order").

[26] For example, the FCC's First Report and Order in the Universal Service Proceeding states that "We therefore decline to adopt embedded costs as the appropriate basis of setting prices for the interconnection and access to unbundled elements. Rather, we reiterate that the prices for the interconnection and network elements critical to the development of a competitive local exchange should be based on the pro-competition, forward-looking, economic costs of those elements, which may be higher or lower that historical embedded costs." *See* Local Competition Order, , ¶ 705.

[27] Here, we are referring to the placing of cable, not splicing.

1   •   *Linear loading factors distort the cost of various UNEs.*   Linear loading factors
2   overstate the cost of installation activities for more expensive pieces of
3   equipment, often associated with higher-capacity services.   Thus, linear loading
4   factors assume that installation costs increase at the same rate as material costs.
5   This is simply not true and results in significant overstatements in installation
6   costs for those more expensive pieces of equipment.   For example, the cost of a
7   POTS plug in card is ***** BEGIN PROPRIETARY   END
8   PROPRIETARY ***** and the cost of a 4-wire card is ***** BEGIN
9   PROPRIETARY   END PROPRIETARY *****. This results in ***** BEGIN
10   PROPRIETARY   END PROPRIETARY ***** the installation costs for a 4-
11   wire card, which is an overstatement because both cards should require similar
12   installation times.

13   •   *Linear loading factors produce obviously illogical results.*   With respect to the
14   objective of this proceeding – to develop the forward-looking costs of UNEs in
15   Illinois – the most significant problem with the linear loading factors relied on by
16   SBC is that they produce such incongruous results.   Overall, these loading factors
17   more than double the resulting investments and UNE costs produced by
18   LoopCAT.[28]

19   We discuss each of these problems in more detail below.

20   **Q.**   **HAVE OTHER STATE COMMISSIONS RECENTLY DETERMINED THAT**

21   **THE USE OF LINEAR LOADING FACTORS IS INAPPROPRIATE?**

22   A.   Yes. BellSouth's new cost proxy model, the BellSouth Telecommunications Loop Model

23   ("BSTLM") can be used with either linear loading factors or with bottoms-up inputs. In

24   the two most recent commission decisions (from the two largest states in BellSouth's

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[28] In fact, SBC's linear loading factors account for the majority of the study's total investments, increasing the costs that would have otherwise been produced by 125%. The analyses supporting this figure are contained in the directory titled "Loading Factor Calculations," included in Attachment BFP/SET-2.

1   territory – Florida and Georgia), Florida and Georgia have rejected BellSouth's reliance

2   on linear loading factors and instead adopted the bottoms-up inputs advocated by CLECs.

3   For example, the Florida Commission determined that BellSouth's linear loading factor

4   methodology could distort costs, particularly when developing deaveraged rates -- a flaw

5   that is also exhibited in SBC's cost studies:

> 6   We find that BellSouth's use of linear loading factors, while easy
> 7   for BellSouth to apply, can generate questionable results,
> 8   especially in light of deaveraged rates. For example, as shown in
> 9   the "Copper Cable 26 Gauge Buried" Table above, for 26 gauge
> 10   buried copper cable, actual material cost as a percentage of total
> 11   cost stays constant at about 14.6 percent no matter whether the
> 12   cable is 12 pair or 4200 pair. Thus, the total cost of this cable is
> 13   always about seven times the actual material cost. No economies
> 14   of scale for exempt material, engineering, or labor, occur.
> 15   However, it is very unlikely that there are no economies generated
> 16   as cable sizes grow larger.[29]

17   More recently, the Georgia Public Utility Commission Staff proposed that the

18   Commission rely on bottoms-up inputs in lieu of BellSouth's linear loading factors in the

19   recent Georgia UNE proceeding. The Georgia Commission subsequently voted to adopt

20   Staff's recommendation and a Final Order is expected in a few months.

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[29] Florida Public Service Commission Order, Investigation into pricing of unbundled network elements, ORDER NO. PSC-01-1181-FOF-TP, May 25, 2001, at 187. *See,* "FL BST May 25 2001 UNE Cost Order.doc" in Attachment BFP/SET-2.

1 **Q.** **DOES THE FCC SUPPORT A BOTTOMS-UP APPROACH TO DEVELOPING**

2 **INSTALLATION COSTS?**

3 A.   Yes. It is also notable that after a multi-year review of cost models and cost model inputs

4   with filed comments from across the industry, the FCC adopted a bottoms-up

5   methodology for use in the USF Synthesis Model. Specifically, the FCC adopted an

6   approach that separately develops equipment quantities and multiplies those quantities by

7   installed material costs for that specific piece of equipment. This bottoms-up approach

8   uses an appropriate methodology for developing total investment for each piece of

9   equipment, taking into consideration the specific size, and material and installation costs.

10 **Q.** **PLEASE EXPLAIN YOUR CHARACTERIZATION OF LINEAR LOADING**

11 **FACTORS AS A "BLACK BOX"?**

12 A.   SBC's linear loading factors are a "black box" because they are based on embedded data

13   that cannot be independently verified by the parties to this proceeding. SBC has not

14   provided underlying information that would enable either the parties to this proceeding or

15   the Commission to evaluate each project that is included in its development of the

16   loading factors. Hence, even if the data would not be too massive for reasonable

17   analysis, it is not possible for anyone to evaluate exactly what is mixed into, and drives,

18   SBC's factors – be it Project Pronto DSL projects, a preponderance of very small

19   projects, plant rearrangements or any other special project activity. In its testimony here,

20   SBC provides no further explanation of its development of these loading factors. And

21   that is not surprising, as SBC witness Mr. Smallwood apparently is unsure how those

22   factors were established. In a recent California deposition, Mr. Smallwood testified that

1   he is unsure of how the data pulled from the PICS/DCPR database is then manipulated to

2   end up with the loading factors:

3   Q. Do you know anything about how the information that ends up
4   being EF&I loading factors is extracted and manipulated to
5   ultimately become the EF&I loading factors?

6   A. Not other than what we have described as far as what the data
7   relationships represent, you know, and that we receive that
8   information from the PICS-DCPR organization.[30]

9   Additionally, when we asked SBC Illinois -- in this case -- to provide access to or a copy

10   of the PICS/DCPR database and queries from the database, SBC Illinois merely sent

11   queries and extracts, but not the database itself.[31]

12   Using SBC's loading factors allows SBC to generate embedded costs through a "back

13   door." By using an embedded relationship of installation cost to material cost, SBC is

14   implicitly reflecting its embedded practices and its embedded network. Obviously, this

15   methodology cannot reflect forward-looking costs because the installation costs are not

16   based on a forward-looking network and do not reflect the economies of scale associated

17   with large-scale construction.

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[30] *Smallwood California Deposition*, 11/12/02, p. 156.

[31] SBC Illinois Response to AT&T Data Request BFP-196. *See,* the directory titled "Illinois Data Requests" in Attachment BFP/SET-2. This directory contains every SBC data response that we have relied upon in our testimony.

1   SBC's loading factors are not documented in a manner sufficient to permit either the

2   parties to this proceeding or the Commission to evaluate the reasonableness of the costs

3   that are included in developing the factors. As a result, these factors amount to nothing

4   more than a "black box."

5   **Q.   WHY DO LINEAR LOADING FACTORS REFLECT EMBEDDED DATA?**

6   A.   As noted earlier, and perhaps most importantly, LoopCAT uses actual material prices,

7   combined with a "loading factor" that is developed from SBC's "embedded" in-plant

8   multipliers. Such an approach does not accurately calculate the forward-looking

9   economic costs of UNEs as is required by FCC rules. SBC's loading factors are based on

10   the installation activities for SBC's embedded equipment and the accounting

11   relationships that resulted from SBC's embedded network design.

12 **Q.   IS THE USE OF EMBEDDED LINEAR LOADING FACTORS CONSISTENT**

13   **WITH PREPARATION OF A FORWARD-LOOKING COST STUDY?**

14 A.   No, embedded linear loading factors fail to reflect economies of scale. SBC's embedded

15   relationships of installation to material costs reflect SBC's experience with construction

16   projects that are much smaller than those that are associated with a scorched node,[32]

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[32] The term "scorched node" is frequently used to refer to the FCC's mandate that the only allowable embedded data should be the geographic map coordinates of ILEC central office buildings.

1   forward-looking cost study as required by the FCC and the ICC. For example, on a per-

2   drop basis, it costs SBC much more to install a single drop wire to a home than it does to

3   install drop wires to all houses along an entire street as part of large-scale construction

4   project. A primary reason for this cost difference relates to economies of scale. With a

5   larger project, the very substantial costs associated with travel and set-up are attributable

6   to multiple drop installations rather than to a single drop installation. Because SBC's

7   embedded installation-to-material cost relationships are weighted towards smaller

8   construction projects (consistent with the fact that SBC is now augmenting its network

9   incrementally), use of linear loading factors in LoopCAT overstates the forward-looking

10   costs of the large-scale construction projects envisioned by the cost modeling processes

11   that should be used by both parties.

12 **Q.**   **ARE NON-TELRIC ACTIVITIES INCLUDED IN THE LINEAR LOADING**

13   **FACTORS?**

14 A.   Yes, this fact is confirmed by Mr. White's testimony in this proceeding. Specifically,

15   Mr. White states that:

16   [T]he cost to add the additional pairs through this reinforcement
17   job was ***** BEGIN PROPRIETARY   END**
18   **PROPRIETARY *****. If the incremental pairs had been added
19   during the initial job, that is, if the initial cable had been sized for
20   the additional pairs, the incremental cost would have been *******

1   **BEGIN PROPRIETARY   END PROPRIETARY *****, or 5%
2   of the current reinforcement cost.[33]

3   Schedule RSW–7 to Mr. White's testimony hammers home this point by providing

4   several examples drawn from one of SBC's internal systems, LATIS, which show that

5   the cost of incremental capacity in an initial construction job is substantially less than the

6   cost of adding the same increment of capacity at a later date. In other words, Mr. White

7   attempts to demonstrate that the types of incremental construction costs that are most

8   likely the major input to SBC's EF&I factors are substantially higher, per unit, than new

9   construction costs that should be used in a TELRIC analysis.[34]

10   Mr. White also emphasizes that SBC's ongoing operations include substantial costs

11   related to rearranging embedded plant:

12   Sometimes it is possible to rearrange existing plant to provide or
13   restore service without having to make costly and disruptive cable
14   reinforcements. However, these rearrangements require
15   installation crews to work on the cables and cross-connections in
16   the field. This work is costly.[35]

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[33] White Testimony, 12/23/02, ¶27.

[34] It is important to remember that a TELRIC analysis requires consistent assumptions. If one were to include the relatively high cost of a current reinforcement job, as SBC's methodology does, one would also have to recognize that the bulk of lines in the same area were installed decades ago as part of a large project and recognize that many of those assets may be mostly or entirely depreciated. Hence, one would need to omit any capital cost for those facilities. However, TELRIC also provides SBC full compensation for those older facilities as if SBC were incurring the cost to reconstruct them today.

[35] White Testimony, 12/23/02, ¶ 28.

1   Because capital costs associated with installation costs of reinforcements are included in

2   the calculation of SBC's loading factors, those embedded installation costs are

3   inappropriate for use in a TELRIC cost study, and they overstate forward-looking costs.

4   In the context of a TELRIC study, EF&I loadings based on historic data merit special

5   scrutiny as the relationship between material investment and related EF&I costs in any

6   given period will reflect the nature of the specific activities that predominate. Over any

7   given span those activities might include, for example, expanding the reach of DSL

8   service via (in part) Project Pronto, or small-scale construction projects to expand an

9   existing, embedded network. Factors based on such activities are not appropriate for a

10   TELRIC study that is intended to represent the cost of constructing a modern and

11   efficient network of considerable scale. Moreover, when more precise data are available,

12   direct estimates of EF&I costs will provide a more precise and relevant result.

13   Q. **DO LINEAR LOADING FACTORS ACCURATELY REFLECT INSTALLATION**

14   **COSTS?**

15   A. No. While we have discussed throughout this testimony the many reasons that using

16   bottoms up installation and engineering hours is a more appropriate methodology to

17   develop the installation costs for a forward-looking network, the large variance in SBC's

18   historic EF&I's malign the use of linear loading factors and provide a transparent

19   illustration as to why this methodology is demonstrably flawed and unreliable. Over the

20   last few years, the telecommunications industry and the economy have observed an

21   economic recession that has significantly depressed prices and reduced output. Even

1   though companies such as SBC attempt to reduce costs when faced with fiscally tight

2   time periods, there is no a priori reason for cost reductions to be achievable at the same

3   rate for different types of expenditures.

4   For example, while material purchases can be easily reduced or eliminated, labor costs

5   are not as readily avoidable. SBC's data demonstrates that this phenomenon is

6   particularly apparent for engineering linear loading factors, which approximately ***

7   **BEGIN PROPRIETARY   END PROPRIETARY *** for cable equipment

8   from 2000 to 2001. Another example that demonstrates the unreliability of the use of

9   SBC's factors is the EF&I factor for buried fiber cable, which was *** **BEGIN

10   PROPRIETARY**

11   **END PROPRIETARY ***[36] The degree of variability

12   in these loading factors may reasonably reflect the short-term relationship between

13   material and engineering and installation costs for a telecommunications company in the

14   normal course of business. However, this variability highlights the fact that EF&I's are

15   inappropriate for development of forward-looking cost assumptions that are, by

16   definition, supposed to abstract from short-term temporary phenomenon such as

17   economic downturns.

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[36] *See,* the directory titled "Illinois Historic Installation Factors" in Attachment BFP/SET- 2.

1   **Q.   DOES THE USE OF LINEAR LOADING FACTORS DISTORT DE-AVERAGED**

2   **UNE COSTS?**

3   A.   Yes, in a study that is supposed to capture costs on a de-averaged basis, the use of linear

4   loading factors can wash out important cost differences. Cables, FDIs, DLCs, and

5   virtually every other piece of equipment will be larger and more expensive in higher-

6   density markets. SBC's use of a single loading factor for each type of investment can

7   substantially overstate installation costs in these higher density areas and understate

8   installation costs in the rest of the state because it applies an *average* multiplier to all

9   investments. For example, a study using an EF&I loading for placing buried copper

10   cable of 0.5 would result in estimates for the cost of placing a $100, 100-pair cable as

11         $50, and the cost to place a $200, 200-pair cable in a denser route as $100. In this

12   illustration there is, however, no reason to expect that it would actually cost twice as

13   much to place the larger cable in a trench (particularly given that the bulk of the cost in

14   both cases is for equipment and labor to create the trench, a cost that would not

15   necessarily vary at all).[37]

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[37] In fact, as will be discussed later, the cost tool used every day by SBC's engineers uses the logic that ***** BEGIN PROPRIETARY   END PROPRIETARY *****.

1 **Q.** **DOES THE USE OF LINEAR LOADING FACTORS DISTORT THE COST OF**

2 **VARIOUS UNES?**

3 A. Yes, the use of linear loading factors can distort the cost difference between different

4 UNE options. As an illustration, according to SBC, installation of a POTS plug-in card

5 costs is ***** BEGIN PROPRIETARY   END PROPRIETARY *****. However,

6 according to SBC, installation of a coin plug-in card costs ***** BEGIN PROPRIETARY**

7 **END PROPRIETARY *****. Thus, SBC's loading factor approach assumes that it

8 will cost two-and-a-half-times more to place a coin card relative to a POTS card. Since

9 this is a labor-driven cost, the implication that it takes a technician more than two and a

10 half times longer to simply "plug-in" a coin card than it does to simply "plug-in" a POTS

11 card makes no sense. It takes a technician the same amount of time to plug-in these two

12 cards. SBC's methodology simply distorts these UNE costs.

13 **Q.** **WHAT EVIDENCE IS THERE THAT THE LINEAR LOADING FACTORS**

14 **SPONSORED BY SBC PRODUCE OBVIOUSLY IRRATIONAL RESULTS?**

15 A. We have already addressed the fact that the use of linear loading factors produces

16 installation costs for larger pieces of equipment that are significantly overstated.[38] We

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[38] Specifically, LoopCAT develops installation costs of ***** BEGIN PROPRIETARY   END
PROPRIETARY ***** for 672 DLC cabinet, while the installation costs for a 2016 cabinet are ***** BEGIN
PROPRIETARY   END PROPRIETARY *****. It should not, and does not, cost *****BEGIN
PROPRIETARY   *** END PROPRIETARY** more to place a 2016 DLC cabinet than a 672 cabinet. *******
(continued)

1   have also illustrated that SBC's linear loading factors substantially inflate the cost of

2   some UNEs.[39] Moreover, we have identified that the linear loading factors increase the

3   material costs in LoopCAT, on average, by a factor of 125%. In addition to these

4   multiple problems, we can also evaluate the installation costs developed by LoopCAT

5   against other sources, including depositions of other SBC witnesses in both California

6   and Texas and against SBC's own internal construction cost estimator.

7   Perhaps most significantly, SBC's LoopCAT produces a total cost for a 2016 DLC-RT --

8   which has the capacity to accommodate 2,016 lines - of *** BEGIN PROPRIETARY

9   END PROPRIETARY ****.[40] Of this total cost, *** BEGIN PROPRIETARY

10   END PROPRIETARY **** is related to the material cost and *** BEGIN

11   PROPRIETARY   END PROPRIETARY **** is related to the installation of the

12   DLC-RT. Assuming SBC's average hourly rate of *** BEGIN PROPRIETARY

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***.

[39] Specifically, we provided an example illustrating that the LoopCAT develops installation costs that are 150% higher for a coin plug-in card than for a POTS card.

[40] To be clear, this number relates only to the DLC-RT portion of the DLC system and does not include the investments at the DLC-COT or the cost of line cards. This number is different from the *** BEGIN PROPRIETARY   END PROPRIETARY **** previously identified as the cabinet portion of the total investment.

1   **END PROPRIETARY ***** for a technician,[41] this equates to a total of 318

2   technician-days to install one DLC-RT. This is the equivalent of a technician installing

3   one DLC cabinet over the period of 1.3 years, or two technicians working full time for

4   nearly 8 months. [42] As SBC's engineering expert in the recent California UNE

5   proceeding recognized, this installation value is significantly overstated:

6   Q. BY MR. DONOVAN: Would it, in your opinion, would it take
7   a number of technician days – I'm trying to get a feel for the
8   amount of labor content associated with this. Would it take a
9   number of technician days? Would it take a lot of technician days?
10   Would it take technician months to install a 672 line DLC RT
11   cabinet?

12   A. MS. BASH: It would not take months.

13   Q. BY MR. DONOVAN: Would it take weeks?

14   A. It would not take multiple weeks.[43]

15   Moreover, SBC has admitted that it assumes the cost of installing a 672 DLC system–

16   which has the capacity for 672 lines–-is exactly the same as the cost of installing a 2016

17   DLC system for the purposes of estimating its construction costs. This fact bluntly

18   contradicts the use of linear loading factors as a foundation for estimating total installed

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[41] *See*, SBC Illinois Opening workpapers at Misc Material Cost 2002 (IL).xls, worksheet Factors cell 34.

[42] The 1.3 years was derived by dividing the total installation cost equal to ***** BEGIN PROPRIETARY END PROPRIETARY ***** by the labor rate of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** per hour assuming 2,000 technician hours per year.

1   costs for digital loop carrier systems.[44] As described, LoopCAT would assume that the

2   cost of the 2016 DLC system is three times that of the 672 DLC system.

3 **Q.**   **HAVE YOU BEEN ABLE TO CORRECT THESE OBVIOUS PROBLEMS WITH**

4   **SBC'S LINEAR LOADING FACTORS?**

5 A.   Yes. We have been able to use SBC's own data to conduct a reliable bottoms up

6   approach. During discovery, we gained access to SBC's internal cost estimation system,

7   the Job Administration Maintenance System ("JAMS"), in order to evaluate how SBC

8   estimates construction costs for its internal purposes. Using this data, we have been able

9   to eliminate most of the loading factors employed by SBC by replacing them with SBC's

10   own construction cost estimates that were derived from JAMS.

11 **Q.**   **PLEASE DESCRIBE SBC'S JAMS.**

12 A.   SBC's JAMS documentation provides the following overview of the system:

13   ***** BEGIN PROPRIETARY**

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[43] *Bash California Deposition*, p. 115.

[44] "The installation cost estimates for the 672 DLC and the 2016 DLC are derived from the JAMS database, which is what was produced in the Estimator Reports, are the same. (April 23, 2003 email from Karl Anderson to Cheryl Hamill). *See,* "April 23, 2003 E-Mail.pdf" in Attachment BFP/SET-2.

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45 Job Administration Management System (JAMS), included as Attachment BFP/SET-3.

1   **END PROPRIETARY *****

2   Moreover, the same documentation continues to discuss the way in which JAMS is

3   structured:

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12   **END PROPRIETARY *****

13   Further, the JAMS documentation continues on to discuss the cost development process:

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46 *Id.*

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2   **5. The Cost Development Process (CDP) in JAM**

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15   [47]

16   **END PROPRIETARY *****

17   Of special note, the JAM documentation discusses the methods and procedures to ensure

18   accuracy:

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[47] *Id.*

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11 **Q.   WILL YOU PLEASE SUMMARIZE THE MOST RELEVANT ISSUES FROM**

12   **THE EXCERPTS ABOVE?**

13 A.   Yes. First, we want to encourage the Commission to review the entirety of the JAMS

14   documentation, especially the overview that we have included as Attachment BFP/SET-

15   3. However, the JAMS excerpts above detail a number of very critical and important

16   pieces of information.

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48 *Id.*

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9   **END PROPRIETARY *****

10   **Q.   WHY IS IT MORE APPROPRIATE TO USE THE COST INFORMATION**

11   **FROM JAMS THAN USING LINEAR LOADING FACTORS?**

12   A.   JAMS contains installation cost estimates that SBC would actually use in running its

13   business, as opposed to black box factors created solely for the purpose of regulatory

14   proceedings that will establish prices SBC can impose on competitors. In other words,

15   we have used SBC's own, at least closer to actual practice, data rather than developing

16   separate installation factors that are used solely for regulatory purposes. In this way, we

17   move LoopCAT a step closer to capturing forward-looking costs, rather than relying on

18   SBC's embedded accounting data that cannot be audited and verified. The JAMS data is,

19   however, still largely based on SBC's embedded practices. Hence, it is still a step short

20   of data that we can affirm, without equivocation, as appropriate for a TELRIC study that

1   is supposed to capture the level of cost that would occur in an efficient operation in a

2   competitive environment.

3   In summary, we recommend that the Commission use a bottoms-up approach to develop

4   accurate cost estimates for performing installation functions similar to the method

5   utilized by SBC's JAMS, rather than SBC's methodology of using linear loading factors

6   in this proceeding.

7   **Q.   WHAT CATEGORIES OF SBC'S INPUTS MUST BE CORRECTED TO**

8   **REFLECT THE "BOTTOMS UP" METHOD OF DEVELOPING COSTS?**

9   A.   As previously identified, SBC uses two types of linear loading factors. The first category

10   of linear loading factors multiplies the directly-developed material investments by a

11   factor to identify installation costs. The second category of linear loading factors does

12   just the opposite – it multiplies the directly-developed installation investments by a factor

13   to identify material costs.

14   **1.   SBC's Reliance on Linear Loading Factors for Installation Costs Must be Rejected**

15   **Q.   HOW DID YOU USE THE JAMS DATA TO RESTATE SBC'S LOOPCAT?**

16   A.   Modifying SBC's LoopCAT using bottoms-up inputs requires that the LoopCAT material

17   cost inputs be modified to reflect total installed costs for each piece of equipment. In

18   addition, the linear loading factors must be eliminated, or "zeroed out." We have

19   received two pieces of information from the JAMS database that enabled us to

20   confidently rely on the time increment data, including (1) tables from JAMS that contain

21   the installation and engineering times associated with outside plant activities and (2)

1   Estimator Reports from JAMS that report the total installed cost of the project which rely

2   in part on the time increment data.[49] In other words, we relied on the underlying JAMS

3   tables provided by SBC and checked those estimates with SBC's Estimator Reports to

4   verify our methodology and ensure we included every step that SBC performs to install

5   each piece of equipment.

6   After this replication process was completed, we applied the installation and engineering

7   times to the appropriate equipment sizes or lengths as used in the LoopCAT. Next, these

8   time estimates were multiplied by the labor rates described in the testimony of Mr.

9   Flappan and added to the material prices to develop total installed costs for each piece of

10   equipment. Finally these restated EF&I cost inputs are populated in the LoopCAT while

11   we removed SBC's linear loading factors by changing them to "0."[50]

12   The procedure used for each piece of equipment followed the same general approach, as

13   described above. Attachment BFP/SET-4 includes several pieces of information related

14   to this process. First, we include copies of the JAM outputs and Estimator Reports that

15   we first replicated to ensure that we understood the underlying JAMS procedures.

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[49] The total installed costs of the outside plant equipment that we were evaluating required numerous inputs to develop including: the installation and engineering time increments, equipment sizes, lengths, quantities of equipment required, labor rate.

1   Second, we include our replication of the JAM outputs and Estimator Reports. Third, we

2   include our application of the JAMS process for all of the equipment sizes for each type

3   of equipment. In addition to the information contained in Attachment BFP/SET-4, we

4   have included the electronic spreadsheets used to perform these calculations as part of

5   Attachment BFP/SET-2 to allow all parties to walk through the electronic process and see

6   the specific formulas used to perform these calculations.

7 **Q.** **HOW DID YOU RESTATE NID AND DROP INPUTS, WHICH WERE**

8   **PURPORTEDLY NOT AVAILABLE IN JAMS?**

9 A.   In order to develop the bottoms up installation cost for NIDs and drop wires, we relied on

10   information provided by SBC in discovery instead of data from the JAMS. While we

11   sought to rely on information from JAMS to restate the installation costs for these pieces

12   of equipment, we did not receive the requisite NID installation data from SBC's JAMS in

13   order to make this calculation.

14   Instead, we used a combination of discovery responses and JAMS. For example, we

15   developed material prices for NIDs based on the current 1-pair and 6-pair material prices

16   of ***** BEGIN PROPRIETARY   END PROPRIETARY ***,**

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[50] For DLC investments, however, the linear loading factor must be changed to a value of "1" to eliminate the
installation portion, thus leaving only the material investments.

1   respectively.[51]   For drop wire, we used JAMS data to get material prices of *** **BEGIN**

2   **PROPRIETARY   END PROPRIETARY ***** per foot for an aerial 2-pair and a

3   buried 3-pair drop and a material price of *** **BEGIN PROPRIETARY   END**

4   **PROPRIETARY *****   *** **BEGIN**

5   **PROPRIETARY   END PROPRIETARY ***** per foot for a buried 6-pair drop.[52]

6   We then applied those per-foot prices to our assumed drop length of 50 feet for Zone 1,

7   100 feet for Zone 2, and 150 feet for Zone 3.

8   In order to restate installation costs, we used the installation times provided by SBC in

9   response to Staff's request PL 2.17a-b. Although we received JAMS output for both

10   NIDs and drops in California, SBC claims that JAMS data does not exist for NIDs for

11   Illinois.[53] Because NID installation times were only provided to us in combination with

12   drop times, we had no choice but to rely on other information provided in discovery

13   instead of raw JAMS data. Unfortunately, these installation estimates prevented us from

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[51] See SBC Illinois response to BFP-113.

[52] *See*, "SERVICE WIRE COST STUDY.xls" file contained in the JAMS directory of Attachment BFP/SET - 2. The JAMS material costs for drop wire were supported by SBC's response to AT&T Data Request BFP-264, which provides prices for drop wire ranging from *** **BEGIN PROPRIETARY   END PROPRIETARY ***** per foot.

[53] Specifically, SBC's correspondence to AT&T regarding access to JAMS data in the recent California UNE proceeding states the following: "it is an Ameritech database that was used by the company's cost group as a starting point to estimate installation times utilized for aerial and buried drops, NIDS and terminals for Pacific's October 18, 2002 cost studies." The ALJs discovery ruling in California and the e-mail from SBC to AT&T are included as "SBC Follow up on databases in CA UNE.doc" in Attachment BFP/SET-2.

1   taking into consideration the different lengths of drops in different zones because they

2   were not reported on a sufficiently granular level of detail. Therefore, these estimates are

3   likely very conservative, especially in urban areas. Since SBC claims that its drop wire

4   installation costs do not assume any specific drop length,[54] and that they do not even track

5   drop lengths installed in Illinois,[55] our restatement is consistent with SBC's approach.

6   However, we did make some necessary adjustments to the installation times provided to

7   us. First, we added in the ***** BEGIN PROPRIETARY   END PROPRIETARY *****

8   minutes that were designated as buried hand trenching and divided that time estimate in

9   half to account for greater efficiencies associated with using trenching machines.

10   Additionally, we cut in half the time estimate of ***** BEGIN PROPRIETARY   END**

11   **PROPRIETARY ***** minutes for aerial mid-span attachment, since the assumption that

12   all aerial drops would have mid-span attachments is completely unsupportable. We then

13   considered that two sets of four drops could be placed in a day, effectively decreasing

14   travel/set-up time and connection times.

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[54] *See*, SBC Illinois Response to AT&T Data Request BFP-316.

[55] *See,* SBC Illinois Response to AT&T Data Request BFP-270.

1 **Q.** **HOW WERE THE INPUTS FOR DS-3 EQUIPMENT DEVELOPED IN THE**

2 **BOTTOMS UP ADJUSTMENTS TO SBC'S STUDY?**

3 A. In order to develop the bottoms up installation cost for DS-3 circuit equipment, we

4 developed our own time estimates because information from JAMS was not available.

5 To install a DS-3, circuit equipment needs to be installed at the customer premise and the

6 central office. The following table reflects our best estimates for the time to install DS-3

7 services over various facilities.

8 **Figure 2**

9 **DS-3 Engineered and Installation Hour Assumptions**

	Customer Premise Equipment		Central Office Equipment	
	Engineering Hours	Installation Hours	Engineering Hours	Installation Hours
OC3	4	5	1	1.5
OC12	8	6	8	6
OC48	8	8	8	8

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11 Ultimately, the total labor hours shown above are multiplied by the labor rate developed

12 by Mr. Flappan and added to an appropriate amount of additional cost to account for

1   exempt material[56] to yield the total installation cost associated with a DS-3 on each of the

2   three types of facilities (OC3, OC12, etc.) studied in SBC's DS-3 cost study.

3 **Q.**   **ARE THE INSTALLATION COSTS ASSUMED IN SBC'S DS-3 COST STUDY**

4   **OVERSTATED?**

5 A.   Yes. SBC's DS-3 loop cost study assumes linear loading factors that are dramatically

6   overstated for both hard-wired and plug-in equipment. Specifically, SBC assumes a

7   factor of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** for all hard-

8   wired circuit equipment and other related equipment and a ***** BEGIN**

9   **PROPRIETARY   END PROPRIETARY ***** factor for plug-in equipment.[57] SBC's

10   linear loading factors for hard-wired circuit equipment are dramatically overstated and

11   obscure the actual functions required to install DS-3 equipment anew and the realistic

12   efficiencies that can be achieved in a forward-looking network.

13 **Q.**   **HOW DID YOU DEVELOP INPUTS FOR THE DS-1 CIRCUIT EQUIPMENT?**

14 A.   Again, SBC's DS-1 loop cost study assumes the same linear loading factors that are

15   assumed in the DS-3 study, and suffer from the same methodological flaw. Thus, we

16   again rely on our own restatements of SBC's cost studies for DS-1 circuit equipment

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[56] Exempt material includes material purchases used to fully install a piece of equipment, such as hammers, nails, etc.

1   because equivalent data was not provided from JAMS. Our assumptions here are the

2   same as shown above for the OC-3 (the assumed technology is SBC's study) customer

3   premises equipment. We further use assumptions of 3 minutes to install a plug-in card,

4   25 minutes each for the smartjack housing and 139 type block terminals and *** **BEGIN**

5   **PROPRIETARY**   **END PROPRIETARY** *** for installing the

6   block terminal (the same as SBC uses in JAMS for 100-pair block terminals). Finally,

7   we assume eight hours for both installation and engineering for the DS-1 repeater bay and

8   shelf and one hour for both installation and engineering for DSX-1 jack.

9   **2.   SBC's DLC Installation Costs Need Additional Modification**

10   **Q.   DO YOU RELY ON JAMS AS THE BASIS FOR THE DLC ENGINEERING AND**

11   **INSTALLATION COSTS?**

12   A.   No. The information we have been provided for JAMS is limited to DLC-RTs.

13   However, we do rely on the JAMS information to substantiate the Project Pronto

14   documentation we ultimately rely on for our bottoms-up DLC installation costs. As

15   described in more detail below, SBC substantially overstates the installed costs of DLC

16   equipment, both at the DLC-RT and at the DLC-COT. Specifically, SBC fails to account

17   for the installation costs included in the terms of its contract with Alcatel. Furthermore,

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[57] For example, see IL_2002_DS3 Loop Circuit Equipment (Urban).xls at input worksheet cells D16:D19.

1   SBC fails to reflect the discounts it receives from Alcatel for the purchase of DLC

2   equipment.

3 **Q.**   **WHAT EVIDENCE DO YOU HAVE TO SHOW THAT SBC'S RELIANCE ON**

4   **LINEAR LOADING FACTORS TO DERIVE THE TOTAL INSTALLED COST**

5   **OF DLC EQUIPMENT DRAMATICALLY OVERSTATES COSTS?**

6 A.   There are literally multiple reasons why SBC's reliance on linear loading factors

7   dramatically overstates the cost of installed DLC equipment:

8   • SBC's contracts with Alcatel, and the prices listed in those contracts, ***** BEGIN**

9   **PROPRIETARY**

10   **END PROPRIETARY*****;

11   • SBC's advocated DLC installation costs directly contradict the installation costs

12   detailed in SBC's Project Pronto documentation;

13   • SBC's advocated DLC installation costs directly contradict the SBC's Estimator

14   Reports;

15   • SBC's advocated DLC installation costs directly contradict the installation costs

16   detailed in SBC's JAMS;

17   • SBC's advocated DLC installation costs directly contradict the testimony of

18   SBC's expert witness (Mr. Trott) in the recent Texas UNE proceeding;

19   • SBC's advocated DLC installation costs directly contradict the testimony of

20   SBC's expert witness (Ms. Bash) in the recent California UNE proceeding;

1   • SBC's advocated DLC installation costs directly contradict the DLC costs

2   detailed by SBC in its recent comments to the FCC; and

3   • SBC's advocated DLC installation costs directly contradict the installation costs

4   detailed in SBC's response to Staff's data requests PL 2.04 and 2.05.

5   With all of this evidence, there is no question that SBC's use of linear loading factors

6   results in a dramatic overstatement of DLC investments.

7 **Q.**   **HOW MUCH DOES SBC ASSERT THAT IT COSTS TO INSTALL A 2016 DLC**

8   **TERMINAL?**

9 A.   The following table replicates the DLC investments developed in LoopCAT based on the

10   inputs advocated by SBC:

11   **Figure 3**

12   **SBC Advocated DLC Investments**

13   ***** BEGIN PROPRIETARY**

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17   **END PROPRIETARY *****

1   In the above figure, one key numbers stand out -- SBC's proposal results in a total cost

2   per DLC-RT system (without any line cards) of ***** BEGIN PROPRIETARY**

3   **END PROPRIETARY ***** is installation labor.[58]

4 **Q.   HOW DOES SBC'S CONTRACT WITH ALCATEL REFUTE THESE**

5   **INSTALLATION VALUES?**

6 A.   SBC's contract with Alcatel specifies that *****BEGIN PROPRIETARY**

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10   **END PROPRIETARY***** Thus, SBC's application of EF&I

11   factors in LoopCAT blatantly double counts costs in its studies by including installation

12   costs twice, both in the vendor price and in EF&I factors.

13   Specifically, SBC has two contracts that govern the purchasing of Alcatel Litespan DLC

14   equipment.[59] Both contracts, the *Master Agreement* and the *Purchasing Agreement*,

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[58] The details supporting this calculation are included in the file Figure 4 AT&T Modified DLC Investments.xls, included in Attachment BFP/SET-2.

[59] Master Agreement No. 99006755 between Alcatel USA Marketing, Inc. and SBC Operations, Inc. for Telecommunications Products (hereafter "*Master Agreement*"), and Purchasing Agreement No. 99007255 for Litespan Product (Next-Generation and Broadband Integrated Digital Loop Carrier) between SBC Operations, Inc. and Alcatel USA Marketing, Inc. (hereafter "*Purchasing Agreement*"). Both of these files were provided as part of
(continued)

1   unambiguously and irrefutably identify that ***BEGIN CONFIDENTIAL

2   END

3   CONFIDENTIAL***

4   As a preliminary matter, SBC identifies that the "discounted prices reflected in the

5   "Exhibit B" price list (effective 7-15-02) of the Litespan Purchasing Agreement No.

6   99007255 were used as the source inputs to LoopCAT."[60] Thus, the inputs that SBC uses

7   in the LoopCAT are derived directly from the same contracts that we identify below,

8   which govern the purchase of Alcatel's Litespan DLC equipment.

9   Specifically, the *Master Agreement* states:

10   *** BEGIN PROPRIETARY

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15   [61]

16   END PROPRIETARY ***

SBC's Response to Joint CLEC Data Request No. 1.95a and are included (with Amendments) in the "Alcatel
Agreement" directory of Attachment BFP/SET-2.

[60] *See*, SBC Illinois Response to AT&T Data Request BFP-114.

[61] *Master Agreement*, § 10.14, p. 34.

1   The *Purchasing Agreement* contains a broader contract term that places this installation

2   language in the context of Alcatel's overall deliverable to SBC:

3   ***** BEGIN PROPRIETARY**

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13   [62]
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15   **END PROPRIETARY *****

16   This contract language indicates the breadth of services included in the prices found in

17   Exhibit B – the price list SBC has identified as the source of its DLC costs inputs.

18   Specifically, Alcatel ***** BEGIN PROPRIETARY**

19   **END PROPRIETARY *****.

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21

22   *****BEGIN PROPRIETARY**

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[62] *Purchasing Agreement*, § 7.1.a, pp. 19-20. [*emphasis added*]

1   *   **END PROPRIETARY***** Because SBC then applies an in-place factor to

2   this investment, SBC double counts and greatly overstates the cost for DLC facilities in

3   its cost study.

4   The language in the Alcatel Purchasing Agreement is very clear. The DLC equipment

5   that SBC purchases under the Alcatel contract includes the ***** BEGIN

6   PROPRIETARY   END PROPRIETARY *** **. In fact,

7   some additional contract terms indicate that additional services are also covered in the

8   Exhibit B price lists, including ***** BEGIN PROPRIETARY   END**

9   **PROPRIETARY *** **.[63] In short, SBC's purchase of DLC equipment out of the Alcatel

10   contract is basically a turnkey job, leaving SBC with only a minimal additional cost.

11   There should be absolutely no confusion about the above language. Indeed, SBC has

12   admitted this fact. Specifically, Mr. Donald G. Palmer, SBC's witness on the Alcatel

13   contract provisions in both the recent Texas UNE proceeding and the recent California

14   UNE proceeding testified that:

15   The prices contained in the Exhibit B price list reflect only the net
16   price of the equipment itself plus, where applicable, any pre-
17   delivery labor and miscellaneous materials associated with specific

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[63] *Purchasing Agreement*, § 9.4, p. 25.

1   pre-assembled Litespan configurations that Alcatel is responsible

2   for prior to deliver or shipment to SBC.[64]

3   Thus, Alcatel has already performed the vast majority of the required integration, and

4   SBC will incur minimal additional cost to drop the system in place and turn it up for

5   service. Clearly the application of linear loading factors to these contract prices results in

6   significant doubling counting of installation costs.

7 **Q.** **WHAT INSTALLATION COST IS INCLUDED IN THE PROJECT PRONTO**

8   **DOCUMENTATION?**

9 A.   As previously identified, we have relied on the installation costs identified in the

10   documentation supporting SBC's Project Pronto business case for our restatement of

11   LoopCAT. In this documentation, SBC has provided significant data regarding the

12   installation costs of Alcatel Litespan 2000 DLC-RTs. Specifically, the Project Pronto

13   documentation identifies both the cost for the Alcatel Litespan system and then a separate

14   value of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** for the

15   engineered, furnished and installed ("EF&I") costs incurred by SBC personnel.[65] In other

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[64] Rebuttal Testimony of Donald Palmer on behalf of SBC Communications, Docket 25834, Proceeding on Cost Issues Severed from PUC Docket 24542, Public Utilities Commission of Texas, February 14, 2003, page 15. *See*, the directory titled "Texas Testimony" in Attachment BFP/SET-2.

[65] SBC provided AT&T permission to use the DLC costs from the Project Pronto business case provided in Texas, Bates No. SWBT-TX 22469 RHX &CVD000979. This documentation is included as Attachment BFP/SET-5.

1   words, there is a minimal amount of cost in addition to the cost already documented from

2   the Alcatel contract for SBC personnel to make the DLC system operational. Thus, in

3   our restatement of SBC's LoopCAT, we used the ***** BEGIN PROPRIETARY**

4   **END PROPRIETARY ***** EF&I value from the Project Pronto documentation as

5   opposed to SBC's flawed linear loading factor approach.

6 **Q.**   **WHAT ARE THE DLC-RT COSTS DEVELOPED BY THE LOOPCAT WHEN**

7   **YOU SUBSTITUTE THE PROJECT PRONTO INSTALLATION COSTS FOR**

8   **SBC'S LINEAR LOADING FACTORS?**

9 A.   In using the Project Pronto installation costs, we have eliminated the linear loading factor

10   approach relied on by SBC in the LoopCAT. The following table shows the DLC-RT

11   investments using our assumptions

1   **Figure 4**

2   **AT&T Restated DLC Investments**

3   ***** BEGIN PROPRIETARY**

4

5   **END PROPRIETARY *****

6   The above figure demonstrates that using the Project Pronto installation costs result in a

7   total DLC-RT cost of ***** BEGIN PROPRIETARY   END PROPRIETARY**

8   *******.[66] However, there are two additional, and important pieces of information

9   highlighted by the above table. First, the DLC-RT costs reflect one-half of the Project

10   Pronto estimates, because the other half is assumed to be associated with the DLC-COT

11   equipment. Second, the LoopCAT applies a land and building factor to the DLC-RT

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[66] The details supporting this calculation are included in the directory titled "Attachment BFP-SET-08 Detail Dev of DLC Comparison."

1   investments such that the cost study includes and additional *** **BEGIN**

2   **PROPRIETARY**   **END PROPRIETARY** *** in construction costs related to the

3   pad, site and rights of way.

4   **Q.   DO THE DLC INSTALLATION COSTS PRODUCED BY LOOPCAT ALSO**

5   **CONFLICT WITH THE ESTIMATOR REPORTS PRODUCED BY JAMS?**

6   A.   Yes. As part of our review of SBC's JAMS, SBC provided us output reports, identified

7   as "Estimator Reports," depicting all costs associated with installing DLC systems.

8   According to our agreement with SBC, these Estimator Reports were prepared by SBC

9   "as an engineer would use the JAM system," to estimate the total installation cost

10   associated with given types of projects. SBC provided these Estimator Reports for both

11   the 672 and the 2016 cabinet and listed 13 steps comprising the installation of a DLC-RT,

12   including 3 steps that were performed solely by contractors. We have included, as

13   Attachment BFP/SET-6, Estimator Reports for both the 672 and 2016 DLCs.[67]

14   The JAMS based estimates indicate that it will take approximately *** **BEGIN**

15   **PROPRIETARY**   **END PROPRIETARY** *** to install a DLC-RT,

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[67] *** **BEGIN PROPRIETARY**

(continued)

1   resulting in a totaled installation cost (including engineering, exempt material and

2   contractor costs) of ***** BEGIN PROPRIETARY   END PROPRIETARY**

3   *******.[68] The estimates produced by JAMS are in-line with both the installation costs of ***

4   **BEGIN PROPRIETARY   END PROPRIETARY ***** identified in the Project

5   Pronto material.

6   **Q.   WHAT OTHER INFORMATION WAS PROVIDED FROM JAMS?**

7   A.   In addition to providing the JAMS Estimator Reports, SBC provided us with the

8   underlying tables that support the JAMS calculations. These tables, included as

9   Attachment BFP/SET-7, provide another view of the cost of installing DLC equipment.

10   Specifically, this information identifies both the material costs of the DLC-RT and

11   getting started package, which together comprise ***** BEGIN PROPRIETARY**

12   **END PROPRIETARY ***** of the total material investment in LoopCAT. Further, these

13   tables identify a total of ***** BEGIN PROPRIETARY   END PROPRIETARY *****

14   hours to turn up a DLC node plus ***** BEGIN PROPRIETARY   END**

15   **PROPRIETARY ***** hours to place the DLC-RT cabinet (including setup). The backup

. **END PROPRIETARY *****

1   tables further identify an additional ***** BEGIN PROPRIETARY   END**

2   **PROPRIETARY ***** hours (including setup) for installing the DLC-RT pad and ground

3   ring. In total, the JAMS backup tables identify a total of ***** BEGIN PROPRIETARY**

4   **END PROPRIETARY ***** hours to install a DLC-RT, or less than one week of

5   labor. It is simply impossible to reconcile this time estimate with SBC's reliance of *******

6   **BEGIN PROPRIETARY   END PROPRIETARY ***** of labor costs in

7   LoopCAT.

8 **Q.**   **DOES THE TESTIMONY OF SBC'S EXPERT WITNESS IN THE RECENT**

9   **TEXAS UNE PROCEEDING ALSO SUPPORT YOUR CONTENTION THAT**

10   **SBC'S PROPOSED INPUTS ARE IN ERROR?**

11 A.   Yes. John C. Trott, a Director of outside plant planning for engineering and construction

12   for Southwestern Bell, recently testified regarding the cost of Alcatel DLC equipment as

13   part of his recent deposition in the Texas UNE proceeding. During his deposition, Mr.

14   Trott confirmed that the LoopCAT, when populated with SBC's proposed inputs,

15   drastically overstates the costs of DLC-RTs. Specifically, Mr. Trott's deposition reads as

16   follows:

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[68] The total JAMS Estimator Report identified ***** BEGIN PROPRIETARY   END PROPRIETARY
***** of total cost. We have removed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** of
material cost to result to arrive at the labor-related costs.

1   Q.   What is the cost to install a 2016.9 in a cabinet?

2   A.   A total cost, in the range of 120 to $150,000.

3   Q.   Is that the installed cost for the 2016.9, or is that simply the
4   cost to install?

5   A.   That's the total cost, including the right of way.

6   Q.   Including the 2016.9 itself?

7   A.   The question was?

8   Q.   Is that 120 to 150,000-dollar range that you gave me – does
9   that include the material cost for the Litespan 2016.9?

10   A.   Material is included in that cost.

11   …

12   Q.   Does that 120,000 to 150,000-dollar range you gave me
13   include line cards?

14   A.   It would include just enough line cards for the commons, to
15   get the channel banks fired up and the commons for the overall
16   assembly.   It would also include enough line cards for
17   approximately six month's worth of growth.[69]

18   To create an apples-to-apples comparison, it is necessary to back out the line cards

19   assumed in Mr. Trott's testimony. We have performed this analysis by using SBC's

20   LoopCAT (for suburban areas) to calculate the assumed percent of working cards for a

21   2016 DLC-RT and thereby conservatively estimate the amount of DLC-RT investment

1   excluding line cards. Specifically, we have started with the midpoint of Mr. Trott's

2   estimate, or $135,000. Using SBC's fill factors, we estimate that ***** BEGIN**

3   **PROPRIETARY   END PROPRIETARY ***** lines out of the 2,016 would be

4   working ***** BEGIN PROPRIETARY   END PROPRIETARY *****.

5   We then divide this figure by 4 to determine the number of lines cards (because each line

6   card accommodates 4 POTS cards and multiply it by the material cost per card of *******

7   **BEGIN PROPRIETARY   END PROPRIETARY ***** to arrive at a total card-

8   related cost of ***** BEGIN PROPRIETARY   END PROPRIETARY *****.

9   Subtracting the ***** BEGIN PROPRIETARY   END PROPRIETARY ***** from

10   Mr. Trott's estimate of $135,000 results in an estimated cost of a fully-installed DLC-RT

11   (excluding line cards) of ***** BEGIN PROPRIETARY   END PROPRIETARY**

12   *******.

13   Comparing Mr. Trott's cost numbers to those in Figure 3, where the EF&I cost for a

14   DLC-RT (without line cards) produced by the LoopCAT is shown as ***** BEGIN**

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[69] *Trott Texas Deposition*, pp. 158-160.

1   **PROPRIETARY**

2   **END PROPRIETARY ***** the value identified by Mr. Trott.[70]

3   In fact, Mr. Trott's testimony validates the estimates we have assumed in the LoopCAT.

4   Using the Project Pronto installation cost of ***** BEGIN PROPRIETARY   END**

5   **PROPRIETARY *****, we estimate a total cost for each DLC-RT of ***** BEGIN**

6   **PROPRIETARY   END PROPRIETARY ***** (excluding line cards) compared

7   to Mr. Trott's estimate of ***** BEGIN PROPRIETARY   END**

8   **PROPRIETARY *****.[71]

9   **Q.   WHY DOES THE LOOPCAT PRODUCE ESTIMATES THAT ARE SO FAR**

10   **OUT OF ALIGNMENT WITH THOSE IDENTIFIED BY MR. TROTT?**

11 A.   It appears that SBC did not have its experts review the LoopCAT derived DLC

12   investments before using those inputs in the cost studies. As Mr. Trott explained in his

13   Texas deposition, he was not consulted on the DLC investments prior to the development

14   of the cost inputs:

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[70] This calculation is extremely conservative because it (1) minimizes card costs by using SBC's unrealistically low fill factors, (2) excludes all card-related costs other than material costs, and (3) does not include the 6-months worth of line card growth assumed by Mr. Trott.

[71] Our estimates are also higher than the maximum value identified by Mr. Trott, *i.e.*, assuming $150,000 per DLC-RT instead of the midpoint value of $135,000.

1   Q.   Did you have any conversations with Mr. Smallwood or
2   other individuals in the cost group prior to the filing of the cost
3   study in Texas regarding the installed cost for DLCs?

4   A.   I did not.

5   Q.   So they did not rely on you as a subject matter expert for
6   the installed cost of DLC to include in the cost study?

7   A.   They did not.[72]

8   It is no wonder that SBC's costs estimates are so unreasonable – SBC's costing

9   department did not consult with its engineering witnesses in deriving the cost estimates.

10   This fact only confirms that the Commission cannot upon the loading factors used in

11   SBC's studies in setting forward-looking, efficient TELRIC rates.

12 **Q.**   **HOW DO THE DLC COSTS PRODUCED BY THE LOOPCAT COMPARE**

13   **WITH THE TESTIMONY OF SBC'S ENGINEERING WITNESS IN THE**

14   **RECENT CALIFORNIA UNE PROCEEDING?**

15 A.   Again, the LoopCAT DLC investments cannot be reconciled with the testimony of SBC's

16   own engineering witness in the recent California UNE proceeding, Cheryl Bash. In her

17   deposition, Ms. Bash limits the amount of time that it would take to install a DLC-RT:

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[72] *Trott Texas Deposition*, pp. 160-161.

1   Q.   Would it, in your opinion, would it take a number of
2   technician days – I'm trying to get a feel for the amount of labor
3   content associated with this.

4   Would it take a number of technician days? Would it take
5   a lot of technician days? Would it take technician months to install
6   a 672 line DLC RT cabinet?

7   Mr. Kridner: Object to a lot.

8   A.   It would not take months.

9   Q.   Would it take weeks?

10   A.   It would not take multiple weeks.[73]

11   Thus, SBC's engineering witness in California limits the amount of time it would take to

12   install a 672 line DLC-RT to, at the least, less than multiple weeks of technician days.

13   While this does not provide a precise value, we can develop a range of installation costs

14   associated with this statement. For example, giving Ms. Bash the benefit of the doubt

15   and capping her estimate of installation times at two technician weeks, we can use a

16   proxy of 80 hours of labor. If one were to double this time estimate to account for

17   engineering (which, we believe is an overly-conservative assumption), this would equate

18   to 160 hours of installation time, or about one month. Conversely, dividing SBC's total

19   installation-related dollars by the labor rate in JAMS (which we believe is overstated, as

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[73] *Bash California Deposition*, p. 115.

1 described in the testimony of Mr. Flappan) of ***** BEGIN PROPRIETARY**

2 **END PROPRIETARY ***** we arrive at a total installation and engineering time of *******

3 **BEGIN PROPRIETARY   END PROPRIETARY *****.[74] This is

4 unrealistic on its face.

5 Thus, the testimony of SBC's own engineering witnesses demonstrate that the Project

6 Pronto installation costs we rely upon for our restatement of LoopCAT are much more

7 reasonable than the regulatory assumptions employed by SBC in its filing of the

8 LoopCAT.

9 **Q.   HOW DO SBC'S ADVOCATED DLC COSTS COMPARE WITH THE DLC**

10   **COSTS THAT SBC PROVIDED TO THE FCC IN THE TRIENNIAL REVIEW**

11   **PROCEEDING?**

12 A.   Like the testimony of its own engineering witnesses, SBC's FCC filings only serve to

13   confirm the illegitimacy of SBC studies. SBC filed an *ex parte* communication with the

14   FCC as part of the recent triennial review proceeding that addressed, among other issues,

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[74] This figure was developed by taking SBC's total EF&I cost of *****BEGIN PROPRIETARY   *** END PROPRIETARY ***** for the DLC-RT equipment plus the pad, site and rights-of-way labor-related costs of *****BEGIN PROPRIETARY   ***END PROPRIETARY ***** (as shown in Figure 3) and dividing it by (2000 * 8) to reflect 2000 technician hours per year and 8 hours per day.

1 its DLC investment on a per line basis.[75] In that *ex parte* filing, SBC identifies what it

2 believes to be the "Engineered, Furnished & Installed ("EFI") cost of the hardware,

3 software, and cabling and wiring associated with GR-303 DLC concentration

4 equipment."[76] Specifically, SBC notes that the investment per line is $84.98 at 250 lines

5 of usage, and that the investment per line is $50.38 at 500 lines of usage.[77]

6 **C. CLEC GR-303**

7 SBC's model includes the Engineered, Furnished & Installed
8 ("EF&I") cost of the hardware, software, and cabling and wiring
9 associated with GR-303 DLC concentration equipment in a
10 configuration representing a 4: 1 concentration ratio. Specifically,
11 the model reflects actual prices of GR-303 equipment produced by
12 a major manufacturer and the installation costs for that equipment
13 in virtual collocation space in a configuration similar to that used
14 by SBC's CLEC affiliate. A CLEC entering the mass-market on a
15 significant scale could obtain similar prices and installation costs.
16 SBC amortized GR-303 costs over 9 years to obtain a monthly per
17 line cost.

Lines	Per Line GR-303 Cost	Amortized Monthly Per Line GR-303 Cost
250	$84.98	$1.30
500	$50.38	$0.77

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[75] SBC Telecommunications, Inc. *Ex Parte* Presentation, UNE Triennial Review Proceeding – CC Docket No. 01-338, Local Competition Proceeding – CC Docket No. 96-98, Deployment of Advanced Wireline Services – CC Docket No. 98-147, January 14, 2003. This document is publicly-available.

[76] *Id*, Attachment 3, p. 5.

[77] *Id*.

1   While this cost information is not an apples-to-apples comparison, because the above

2   equipment is installed in ILEC central office rather than at a DLC-RT, the cost

3   differences between what SBC has advocated as part of its FCC filings and what it has

4   advocated in this proceeding are substantial and cannot be explained by the difference

5   between installing this equipment at the DLC-RT and in the central office.[78]

6   For this equipment, SBC is asserting that it will cost $101,566 for fully-installed DLC

7   GR-303 equipment – including all of the associated line cards.[79] Referring back to Figure

8   3, SBC advocates a value that is almost *** **BEGIN PROPRIETARY**   **END**

9   **PROPRIETARY** *** this cost for its DLC-RTs, *without a single line card*. Not only

10   has SBC failed to provide any explanation for such drastic increases in average costs per

11   line compared to those it provided to the FCC, the differences here are so staggering that

12   one must only question the validity of the inputs SBC has proffered in different

13   proceedings that are designed for different objectives.

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[78] According SBC engineer Mr. Trott the costs of installing DLC-RT equipment is less expensive than installing the central office equipment: "The remote terminal piece would be less expensive than – the RT piece would be less expensive than installing than the central office components." (*Trott Texas Deposition*, p. 164)

[79] Interestingly, SBC asserts, in LoopCAT, that an installed plug-in card costs *** **BEGIN PROPRIETARY   END PROPRIETARY** *** per line. This leaves only *** **BEGIN PROPRIETARY   END PROPRIETARY** *** per line associated with the common equipment. For a fully-loaded 2016 GR-303 terminal, this would result in total common equipment investment of only *** **BEGIN PROPRIETARY   END PROPRIETARY** ***. Further, given SBC's assertion that, at most, one can only achieve *** **BEGIN PROPRIETARY   END PROPRIETARY** *** utilization of plug-in cards, the LoopCAT develops an
(continued)

1 **Q.** **DO SBC'S ADVOCATED DLC INSTALLATION COSTS AS DEVELOPED IN**

2 **LOOPCAT AGREE WITH THE ADDITIONAL INFORMATION SBC**

3 **PROVIDED IN DISCOVERY?**

4 A. No. SBC's Response to Staff's Data Requests PL 2.04 and 2.05 also provide relevant

5 information regarding the amount of time necessary to install a DLC-RT. Specifically,

6 these data requests and responses are shown below:[80]

7 **Request:** Please answer the following concerning the
8 installation of the LS2000 LSC-2016 Cabinet 2016 W/E, 3PDFA:
9 (b) Please provide an hourly estimate for each of the
10 tasks identified in response to subpart (a) of this request.

11 **Response:**

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effective cost per working line of ***** BEGIN PROPRIETARY** **END PROPRIETARY ***** more than the
entire cost of the GR-303 equipment it has documented to the FCC.

[80] SBC's Responses to Staff's Data Requests PL 2.04 and 2.05 are included in Attachment BFP-2.

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8   **END PROPRIETARY *****

9   Again, even assuming that these times should be doubled (which it should not be) to

10   account for associated engineering time, this would still only equate to approximately

11   ***** BEGIN PROPRIETARY   END PROPRIETARY ***** of total time, not the

12   ***** BEGIN PROPRIETARY   END PROPRIETARY ***** SBC assumes in the

13   LoopCAT.

14   **Q.   HAVE OTHER STATE COMMISSIONS ALREADY ADDRESSED THIS ISSUE?**

15   A.   Yes. This same issue was central in an examination of the cost of unbundled loops in a

16   recent cost proceeding in Wisconsin. In that cost proceeding, the Wisconsin Public

17   Service Commission found that SBC acknowledged that its Alcatel contract already

18   included the installation cost for the system,[81] and that it therefore did not need to utilize

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[81] Before the Public Service Commission of Wisconsin, *Investigation Into Ameritech Wisconsin's Unbundled Network Elements*, Docket No. 6720-TI-161, p. 146 (hereafter "*Wisconsin Order*") which is contained in the directory titled "Wisconsin Decision" within Attachment BFP/SET-2.

1   the higher linear loading factor of 2.4194 for DLC equipment.[82] Instead, SBC Ameritech

2   opted to ask for a much smaller factor of 1.0824 to pick up incremental work performed

3   by its engineers and technicians that was not already included in the price of the DLC

4   equipment in the Alcatel contract.[83]

5   Thus, SBC is proposing a DLC installation factor that is much higher than the factor it

6   ultimately proposed in Wisconsin, despite the fact that the equipment at issue in

7   Wisconsin proceeding and in this proceeding was obtained pursuant to the same Alcatel

8   contract. SBC's current cost advocacy is especially disconcerting since the Wisconsin

9   Commission relied on the same contract provision we referenced above in reaching its

10   conclusion:

11   ***BEGIN PROPRIETARY

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16   [84]

17   END PROPRIETARY***

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[82] This factor is notably much lower than SBC's currently-proposed linear loading factor of *** BEGIN
PROPRIETARY   END PROPRIETARY ***.

[83] *Wisconsin Order at* p. 147.

[84] *Id*.

1 **Q.** **WHY WOULD SBC ADVOCATE DLC INSTALLATION COSTS THAT ARE SO**

2 **PROFOUNDLY MISALIGNED WITH ITS OWN TESTIMONY IN OTHER**

3 **PROCEEDINGS AND WITH ITS OWN INTERNAL SOURCES?**

4 A. We cannot answer this question. No matter how inconceivable, SBC continues to proffer

5 cost estimates that numerous sources have already proven to be false. Rather than relying

6 on detailed cost estimates, SBC relies on the linear loading factors, which produces

7 obviously irrational results. One reason for this disconnect is explained in the deposition

8 of SBC engineering witness Mr. Trott in Texas:

9 Q. Is that 120 to 150,000-dollar range that you gave me – does
10 that include the material cost for the Litespan 2016.9?

11 A. Material is included in that cost.

12 Q. Do you know generally if that is consistent with the total
13 installed cost for an Alcatel 2016.9 that Southwestern Bell
14 included in its loop cost study.

15 A. I know there's a difference.

16 Q. Do you know if the costs included in the Southwestern Bell
17 cost study is higher?

18 A. The cost study in the Southwestern Bell cost study is
19 higher. The rationale they used is they aggregated all of the x57,
20 257, 357 for both the central office and the outside plant, and they
21 did a relationship between the material costs to come up with an
22 in-place cost factor, and they used an aggregate in-place cost factor
23 for the entire universe of the 57 account and then applied it

1   equitably – applied it equally to each of the components, which is,
2   in my opinion, a reasonable way to approach the cost study.[85]

3   Although we strongly disagree with Mr. Trott's conclusion that an approach that

4   overstates costs to such an extent is reasonable, his testimony does shed some light on the

5   rough process relied on by SBC for estimating these costs. Specifically, the linear

6   loading factors include all sorts of equipment that are not associated with unbundled

7   loops, particularly transport equipment that Mr. Trott identifies as being more expensive

8   to install than DLC-RT equipment.[86]

9   To summarize, SBC's use of linear loading factors produces installed costs that indicate

10   that it will take *** **BEGIN PROPRIETARY**   **END**

11   **PROPRIETARY** *** to engineer and install a DLC-RT. This is patently unreasonable

12   and cannot be supported by its own witnesses' testimony, its *Purchase Agreement*

13   language, or its internal cost estimating methods. Fundamentally, the problem with

14   SBC's approach in developing its DLC investments is that the material costs for Litespan

15   2000 systems in LoopCAT already include much of the installation costs for these

16   systems. Only modest additional installation cost is therefore required. SBC's approach

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[85] *Trott Texas Deposition*, pp. 158-159.

[86] *Trott Texas Deposition*, pp. 163-164.

1   ultimately double counts costs because such costs are already included in SBC's contract

2   price for Alcatel's DLC equipment.

3   **Q.   CAN YOU PLEASE SUMMARIZE THE VARIOUS COST ESTIMATES THAT**

4   **HAVE BEEN DEVELOPED FOR DLC INVESTMENTS?**

5   A.   Yes. Our testimony has identified multiple sources for estimating the cost of DLC

6   terminals. This data -- including, SBC's contract provisions with Alcatel, the Project

7   Pronto documentation, Mr. Trott's deposition in Texas, Ms. Bash's deposition in

8   California, SBC's *ex parte* to the FCC, SBC's own internal JAMS, and SBC's other data

9   responses -- all provide a consistent cost estimate for DLC equipment. The unambiguous

10   outlier is the set of regulatory inputs that SBC is sponsoring in this proceeding.[87]

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[87] The workpapers supporting the development of this figure are provided in Attachment BFP/SET-8 and included in the directory titled "Attachment BFP-SET-08 Detail Dev of DLC Comparison Proprietary" of Attachment BFP/SET-2.

1   **Figure 5**

2   **Various DLC Installation Sources**

3   ***** BEGIN PROPRIETARY**

4

5   **END PROPRIETARY *****

6   **Q.   WHAT IS THE APPROPRIATE AMOUNT OF DLC INSTALLATION COSTS**

7   **TO INCLUDE IN LOOPCAT?**

8   A.   In our restatement of SBC's LoopCAT, we used the ***** BEGIN PROPRIETARY**

9   **END PROPRIETARY ***** EF&I value noted in the Project Pronto

10   documentation as opposed to SBC's flawed linear loading factor approach.   Furthermore,

11   the installation for plug-in cards would be included in these costs, and no additional

12   installation factor should be applied to the plug-in cards. As described above in our

13   testimony, the *****BEGIN PROPRIETARY**

14   **END PROPRIETARY***** and Mr. Trott's deposition all make clear that

15   the DLC-RT equipment is pre-assembled at the factory and additional costs are not

16   appropriate.

1 In the end, SBC's DLC-RT installation costs are simply not believable. The above table

2 clearly identifies that our proposed corrections are extremely conservative given the vast

3 amount of information available on this matter.

4 **C.** **SBC Either Fails To Reflect the Economies Associated With Larger**
5 **Equipment Sizes Or Fails To Use The Most Efficient Equipment**

6 **Q.** **DOES SBC APPROPRIATELY REFLECT THE MOST EFFICIENT NETWORK**

7 **CONSISTENT WITH TELRIC REQUIREMENTS WHEN INPUTTING**

8 **EQUIPMENT SIZES?**

9 A. No. Another problem with LoopCAT is that it does not reflect economies of scale in

10 equipment prices. In fact, there are numerous instances in which the economies of scale

11 that LoopCAT associates with equipment are completely irrational. Three examples are

12 (1) building cable, (2) copper cable used for both distribution and feeder, and (3) the

13 feeder distribution interfaces.

14 LoopCAT does not reflect consistent economies of scale as building entrance cables

15 increase in size. For example, the results show that a 600-pair building cable costs more

16 than two 300-pair cables. This makes no sense. First, why would a telephone company

17 install a 600-pair cable when it is appears to be substantially more expensive – in this

1   case ***** BEGIN PROPRIETARY   END PROPRIETARY ***** more expensive –

2   than using two 300-pair cables?[88] It would not. Second, it similarly makes no sense that

3   a 600-pair building cable should cost ***** BEGIN PROPRIETARY   END**

4   **PROPRIETARY ***** more than two separate 300-pair cables. Even if there was some

5   rational basis for this unusual relationship, a TELRIC study should not use the 600-pair

6   cable when the cost of a 300-pair cable is so much cheaper – nor should SBC if it

7   operates in an efficient manner.

8   SBC's LoopCAT study produces a similarly anomalous result for copper feeder and

9   distribution cable. If, for example, network design calls for a 22-gauge 600-pair buried

10   copper cable**,** purchasing one 600-pair copper cable should be more cost-effective than

11   purchasing two 300-pair copper cables. According to the LoopCAT inputs, however,

12   placing two separate 300-pair cables is less expensive than placing one 600-pair copper

13   cable.

14   Likewise, LoopCAT inappropriately assumes one 5,400 size FDI instead of placing a less

15   expensive pair of 2,700 size FDIs, thereby overstating TELRIC by ***** BEGIN**

16   **PROPRIETARY   END PROPRIETARY *****. Again, even if it costs more to

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[88] In this case, a 300-pair building cable costs ***** BEGIN PROPRIETARY   END PROPRIETARY ***** per foot, or a total cost of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** for 600-pairs. On the
(continued)

1   purchase a 5,400 size FDI than it costs to purchase two 2,700 size FDIs, a properly-

2   developed TELRIC model will not use such inefficient equipment. In this case, the

3   LoopCAT should be adjusted to place two 2,700 size FDIs instead of one 5,400 pair FDI.

4   We have corrected the LoopCAT to reflect the least-cost technology solution rather than

5   using inefficient equipment by adjusting the cost inputs for a 5,400 size FDI with the cost

6   of two 2,700 size FDIs.[89]

7   **D.   The LoopCAT Double Counts, And Even Triple Counts The Required**
8   **Equipment**

9   **Q.   HOW DOES SBC ESTIMATE THE COSTS FOR DISTRIBUTION TERMINALS?**

10   A.   SBC inappropriately assumes that each and every SBC customer will have a connection

11   to an FDI. However, many larger buildings have feeder cable (either copper or fiber)

12   terminating directly in the building, which is then connected to a block terminal. Thus,

13   buildings that are served directly via feeder facilities will not have both an FDI and a

14   block terminal. LoopCAT ignores this fact and mistakenly assumes that every single

15   loop will require multiple terminations (*i.e.*, 100% premise terminations and 100 percent

---

other hand, one 600-pair cable costs *** **BEGIN PROPRIETARY   END PROPRIETARY** ***.

[89] The details supporting our unit cost inputs to reflect the more efficient technology solution are provided in the
"LoopCAT Adjustments Workpapers and JAMS Replications" directory in Attachment BFP/SET-2.

1   FDIs). The result is that LoopCAT includes costs that simply do not exist in SBC's

2   embedded network, much less a forward-looking one.

3   **Q.**   **HOW ELSE DOES THE LOOPCAT DOUBLE COUNT AND EVEN TRIPLE**

4   **COUNT THE REQUIRED EQUIPMENT?**

5   A.   LoopCAT also fails to recognize the fact that *not all* residential customers live in single-

6   family homes but instead live in multiple dwelling units ("MDUs"), such as apartment

7   buildings and condominium complexes. In this situation, LoopCAT assumes that NIDs,

8   distribution terminals *and* FDIs are assumed to exist at every living unit, even though

9   only a block terminal (and, in some cases, FDIs) would actually be required.

10   **Q.**   **WHAT EVIDENCE SUGGESTS THAT DISTRIBUTION TERMINALS ARE**

11   **NOT ALWAYS REQUIRED?**

12   A.   Interestingly, SBC's own witnesses confirm this fact. Information Mr. Smallwood

13   provided in his recent California deposition illustrates that not all loops have distribution

14   facilities (which is when you would require an FDI):

15   Q. You would agree there are fewer working copper feeder pairs
16   than there are -- that would be just be copper. Let me see if I
17   understand what you are saying, then. You are saying that the
18   reason there are fewer working distribution pairs than working
19   loops is because of the fairly large number of them that are direct
20   fed off a feeder and not served off of any copper distribution?

1   A. That's right.[90]

2   In this proceeding, the data provided by SBC confirms this information. Specifically,

3   SBC's supporting workpapers show that approximately *** **BEGIN PROPRIETARY**

4   **END PROPRIETARY** *** of all loops served by SBC do not have any distribution

5   facilities.[91] Specifically, the data shows that there are *** **BEGIN PROPRIETARY**

6   **END PROPRIETARY** *** working copper feeder loops and *** **BEGIN**

7   **PROPRIETARY   END PROPRIETARY** *** fiber-fed feeder loops in SBC's

8   territory while there are only *** **BEGIN PROPRIETARY   END**

9   **PROPRIETARY** *** working distribution loops. The remainder of these loops reflects

10   those customers that have no distribution cable and would be served by a block terminal

11   located in high-rise buildings. LoopCAT fails to account for this fact, as it includes costs

12   for distribution cable and NIDs for every line.

13   Further, SBC's Response to AT&T Data Request No. BFP-364 clarifies this fact:

14   there are locations that are not interfaced, but are direct fed by
15   feeder cable, and thus do not have distribution cable. Examples of
16   this would be:

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[90] *Smallwood California Deposition*, pp. 268-269.

[91] See Attachment BFP/SET-9, which is drawn directly from SBC's backup documentation in the file
"ILCurrentFillData2002 (Jan02).xls."

1   a) Commercial buildings that do not have SBC Illinois distribution
2   cable within them

3   b) Apartment complexes that do not have SBC Illinois distribution
4   cable within the complex

5   c) Direct fed terminals that have not been placed behind an FDI.

6   As we identify above, ***** BEGIN PROPRIETARY   END PROPRIETARY ***** of

7   loops do not require distribution cable and therefore do not require an FDI, but this figure

8   varies by density zone. In order to develop more appropriate de-averaged loop rates, we

9   have corrected SBC's application of LoopCAT to reflect the occurrence of FDIs that

10   would actually exist, consistent with the data provided by SBC in this proceeding. The

11   following data reflects the percent occurrence of FDIs, by zone, that are appropriate for

12   use in the LoopCAT:

1   **Figure 6**

2   **Percent Occurrence of FDIs, By Zone**

3   ***** BEGIN PROPRIETARY**

4

5   **END PROPRIETARY *****

6   Specifically, we have corrected the LoopCAT to remove unnecessary FDIs by adjusting

7   cell "G41" in the "Expanded_Summary" sheet of LoopCAT to reflect the percent

8   occurrence identified in the above table.[92]

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[92] SBC's use of 100% FDIs is wrong.   SBC even admits that FDIs should not be deployed for every loop in the
forward-looking network:

>   Request: Please confirm or deny that an FDI is only necessary if there is distribution
>   cable.

>   Response: Confirm. When an FDI is placed in a forward-looking model, there will be
>   associated distribution cable behind the FDI. SBC Response to AT&T Data
>   Request No. BFP-362 (contained within Attachment BFP/SET-2.)

1 **Q.** **WHAT EVIDENCE SUGGESTS THAT SBC HAS FAILED TO INCORPORATE**

2 **MULTIPLE DWELLING UNITS?**

3 A. SBC has previously admitted that it has failed to incorporate MDUs in developing its cost

4 estimates. Specifically, Mr. Smallwood, in his California testimony, states that:

5 Joint Applicants contend that SBC California's LoopCAT model
6 does not address instances where residential customers are located
7 in a multiple dwelling unit ("MDU"). SBC California does not
8 deny that MDUs are a factor that affects the deployment of
9 premises termination equipment in California. SBC California
10 assumed that each residential customer would have a separate NID
11 when modeling residential premises termination equipment. At the
12 time SBC California's cost study was prepared, data were not
13 readily available to incorporate MDUs into the cost analysis.[93]

14 The above quotation encompasses Mr. Smallwood's entire testimony on this issue. Most

15 importantly, Mr. Smallwood acknowledges that MDUs do affect the deployment of

16 premises termination equipment. What Mr. Smallwood does not admit is that NIDs are

17 substantially more expensive than block terminals, on a per-line basis. Specifically, the

18 LoopCAT filed by SBC develops a per-line NID investment of ***** BEGIN**

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[93] Rebuttal Declaration of James R. Smallwood, Filed on Behalf of Pacific Bell Telephone Company [Public Version], Public Utility Commission of the State of California Applications 01-02-035, 02-02-031, 02-02-032, 02-02-034, 02-02-002, Joint Application of AT&T Communications of California, Inc. and WorldCom, Inc., for the Commission to Reexamine the Recurring Costs and Pieces of Unbundled Switching in its First Annual Review of Unbundled Network Element Costs Pursuant to Order Paragraph 11 of D.999-11-050 and Related Cross Applications, p. 37 (hereafter "*Smallwood California Rebuttal Declaration*").

1   **PROPRIETARY   END PROPRIETARY *****.[94] However, the LoopCAT develops

2   a per-line block terminal investment of ***** BEGIN PROPRIETARY   END**

3   **PROPRIETARY *****,[95] only one-fifth of the per-line NID investments that SBC actually

4   uses for customers in MDUs.

5   Further, MDUs generally are not served by distribution terminals because they will have

6   block terminals in the basement of the building. With an average per-line investment of

7   ***** BEGIN PROPRIETARY** $ **END PROPRIETARY *****, this duplicative

8   investment artificially increases the costs of UNE loops.[96]

9   Finally, MDUs are often served directly by feeder facilities terminating in the building,

10   meaning that no distribution cable is used. Thus, these buildings would not require FDIs,

11   overstating per-line investments by ***** BEGIN PROPRIETARY** $ **END**

12   **PROPRIETARY *****. In the end, SBC admits that failing to include MDUs affects

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[94] This figure is derived using Zone 2 data and taking the weighted average of SBC's per-line aerial NID investment of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** (with SBC's assumed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** aerial NIDs) and SBC's per-line buried NID investment of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** (with SBC's assumed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** buried NIDs).

[95] This figure is derived using Zone 2 data and taking the weighted average of SBC's per-line aerial block terminal investment of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** (with SBC's assumed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** aerial NIDs) and SBC's per-line buried NID investment of ***** BEGIN PROPRIETARY   END PROPRIETARY ***** (with SBC's assumed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** buried NIDs).

[96] Again, this per-line investment figure is based on Zone 2 data.

1   costs, but SBC continues to sponsor a cost study that knowingly produces erroneous, and

2   inflated, results.

3   **Q.   WAS SBC AWARE OF THIS ERROR PRIOR TO FILING THE LOOPCAT IN**

4   **THIS PROCEEDING?**

5   A.   Yes. SBC was aware of this error on November 11, 2002, if not before. In fact, these

6   issues were discussed during Mr. Smallwood's deposition in the California UNE

7   proceeding in which he provided the following testimony:

8   Q. Does the study treat multiple unit dwellings in a different way,
9   or apartment complexes?

10   A. As far as the business premises termination, we have looked at
11   the different sizes of –

12   Q. I'm talking about residentially, as far as residences are
13   concerned.

14   A. No.[97]

15   Given that SBC's testimony in this proceeding was filed on December 23, 2002, SBC

16   cannot claim that it was unaware of this error. This is a simple situation where SBC has

17   not corrected known errors in its cost studies prior to filing. Correcting such errors would

18   certainly result in a significant reduction in loop costs. As we identified above, the errors

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[97] *Smallwood California Deposition*, pp. 66-67.

1   resulting from SBC's failure to recognize multiple dwelling units overstates the cost of

2   premise termination investments by about ***** BEGIN PROPRIETARY   END

3   PROPRIETARY *****.[98] This is yet another example of SBC recommending costs in

4   Illinois is that it knows to be overstated.

5   **Q.   WHAT PERCENTAGE OF RESIDENTIAL HOUSEHOLDS LIVE IN MULTI-**

6   **DWELLING UNITS?**

7   A.   According to 2000 U.S. Census Data for Illinois, approximately 34 percent of all

8   households in Illinois live in multi-unit structures such as apartments, condominiums,

9   duplexes, and the like.[99] As the following figure demonstrates, nearly 84 percent of the

10   1.6 million households that reside in multi-dwelling units are located in the Chicago

11   metropolitan area.

12

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[98] This figure is derived by adding together the cost identified above for distribution terminals plus FDIs plus the difference between the cost of NIDs and block terminals *****BEGIN PROPRIETARY   END PROPRIETARY *****.

[99] The information cited here can be found on the U.S. Census FactFinder at http://factfinder.census.gov/ and is included as Figure 7 MDU Distribution.xls in Attachment BFP/SET-2.

1 **Figure 7**

2 **Distribution of Multi-Dwelling Units in Illinois**

3

	Zone 1 (Chicago)		Zone 2 & 3 (Non-Chicago)		Total Illinois	
	Nb. Units	% of total	Nb. Units	% of total	Nb. Units	% of total
Single Family Homes	1,776,005	56.1%	1,449,041	84.1%	3,225,046	66.0%
2 units	277,833	8.8%	60,232	3.5%	338,065	6.9%
3 or 4 units	255,893	8.1%	62,601	3.6%	318,494	6.5%
5 to 19 units	416,577	13.2%	96,266	5.6%	512,843	10.5%
20 or more units	437,227	13.8%	53,940	3.1%	491,167	10.1%
Total 2 Units or More	1,387,530	43.9%	273,039	15.9%	1,660,569	34.0%
Total Housing Units	3,163,535		1,722,080		4,885,615	

7

8

9 While U.S. Census data demonstrates that a significant portion of Illinois residents live

10 in multi-dwelling units, SBC's LoopCAT study treats these customers as if every single

11 residential customer lives in detached houses, thereby dramatically overstating premise

12 termination costs. This assumption -- which is acknowledged by SBC -- is fundamentally

13 flawed because large apartment complexes do not require the provisioning of a NID for

14 every apartment or a six-line, 100-foot drop wire for every apartment.[100] In other words,

---

[100] See SBC Illinois Response to AT&T Data Request BFP- 291: "SBC confirms that less than 100% of all residential locations are served by SBC owned NIDs. SBC Illinois is in the process of installing NIDs at the remaining locations where they are required. SBC Illinois notes that NIDs are not required at all residential (continued)

1   for every customer that SBC erroneously assumes lives in a stand-alone house, it includes

2   equipment costs that SBC does not actually incur.   Furthermore, there are economies of

3   scale and potential efficiencies that exist for service to an apartment building that further

4   reduce the cost well below SBC's estimate.

5   **Q.   WHAT APPROACH DO YOU RECOMMEND FOR DEVELOPING THE COST**

6   **FOR MULTIPLE-DWELLING UNITS?**

7   A.   Because of the logical similarities, premises termination costs for MDUs should be

8   developed in a similar fashion as business locations. For this reason, our restatement

9   applies the methodology developed in SBC's LoopCAT study to estimate business

10   premises termination costs to multiple-dwelling units. Specifically, the costs for an

11   apartment should include a wire apparatus/wire protector of either a 25 or 50-pair size

12   (depending on the size of the apartment) in combination with a building entrance cable.

13   In order to implement this change, we used Census data for the Chicago metropolitan

14   area for Zone 1 and Non-Chicago statistics for Zones 2 and 3.

15   Specifically, from the figure above, we used the 13.8 percent of households in apartments

16   of 20 or more units under Zone 1 and 3.1 percent of households in apartments of 20 or

---

locations. SBC Illinois also notes that some residential locations may currently lack NIDs as a result of their
removal by AT&T employees installing AT&T local service."

1   more units under Zones 2 and 3 and used the cost of a 50-pair wire apparatus consistent

2   with SBC's approach for business premises terminations. Similarly, for apartments with

3   5 to 19 units, we used 13.2 and 5.6 percent of households for Zone 1 and Zones 2 and 3,

4   respectively, to evaluate the costs on a 25-pair wire apparatus. We assumed that

5   households in multi-dwelling units of four units or less would still require individual

6   NIDs. This approach is far superior to SBC's assumption that all households are stand-

7   alone dwellings because it more accurately portrays SBC's network and portrays the real

8   world cost differences associated with serving these different structures.

9   Q.   **WERE THERE ANY OTHER RELATED CORRECTIONS REQUIRED TO**

10   **INCORPORATE THIS ADJUSTMENT?**

11   A.   Yes. SBC's LoopCAT includes a calculation of the probability that a distribution

12   terminal will be required, which in turn is dependent on the percentage of lines that are

13   served via building entrance facilities and larger wire apparatus (25-pair and above).

14   Since our methodology assumes that some residential lines are served with this type of

15   configuration, we have reduced the percentage of lines that require distribution terminals.

16   E.   **The Loop Sample Preprocessing Methodology Is Flawed**

17   Q.   **WHAT IS THE LOOP SAMPLE PREPROCESSING METHODOLOGY?**

18   A.   The loop sample preprocessing methodology is a process that turns millions of sample

19   records from SBC's Automated Records and Engineering System ("ARES") loop data

20   and collapses those records into only three loop records for the purpose of estimating

21   loop costs. The process that SBC uses to perform these calculations is called the

1   PreProcessor. As we explain in detail below, SBC's cost studies contain errors in both

2   the underlying loop sample data and in the approach used in the PreProcessor.

3 **Q.   DOES SBC'S LOOP DATA RELY ON A SAMPLE OR ON THE ENTIRE**

4 **UNIVERSE OF LOOPS?**

5 A.   While SBC's testimony implicitly suggests that its cost study relies on the full universe of

6   loops in SBC's service territory, as represented in ARES, this is simply not true. In fact,

7   SBC's total loop sample reflects only 68% of all loops in SBC's territory, as identified by

8   SBC's Loop Engineering Information System ("LEIS").[101] Thus, SBC's testimony in this

9   proceeding is simply false, as it unequivocally states that the LoopCAT includes the

10   "universe" of loops in the underling system:

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[101] Specifically, SBC's LoopCAT shows that the study includes *****BEGIN PROPRIETARY   END PROPRIETARY***** loops ("PreProcess" worksheet) while SBC's fill factor data shows that there are *****BEGIN PROPRIETARY   END PROPRIETARY ***** working loops in SBC's Illinois territory ("ILCurrentFillData2002 (Jan02).xls"). SBC's Response to March 31, 2003 Transcript Request, provided by SBC on April 4, 2003, clearly admits this fact:

> The replacement CD responsive to Joint CLEC data request 1.98 provided to the parties on April 1, 2003 includes all of the loop length information used in SBC Illinois' UNE loop cost study and was obtained from the ARES database. This information comprised all of the working loop information that SBC Illinois was able to pull from the ARES database at the time that the data set was compiled. For the reasons discussed below, that data set did not constitute the entire universe of all working loops in SBC Illinois' network. Nonetheless, the information that SBC Illinois was able to pull constituted a data set of approximately five million loops out of a total population of approximately seven million loops. This constitutes approximately 70% of the population of available loops and constitutes a valid base of data from which to calculate average loop lengths.

(continued)

1   The loop length information for the UNE loop costs developed in
2   LoopCAT is based on actual loop data obtained by extracting the
3   universe (i.e., not merely a sample) of the loop information
4   contained in the Automated Records and Engineering System
5   ("ARES") database.[102]

6   This Commission should not be mislead by false claims of accuracy in SBC's testimony.

7   **Q.   DOES SBC'S EXCLUSION OF CERTAIN LOOP TYPES IMPACT THE COST**

8   **ESTIMATES PRODUCED BY THE STUDY?**

9   A.   Yes. SBC's April 4, 2003 response the March 31, 2003 Transcript Request

10 (included in Attachment BFP/SET-2) explains that that SBC's cost studies do not include

11 those loops that do not have a working telephone number ("WTN"): "[S]ome circuits in

12 LFACS are non-switched circuits and therefore, do not have a WTN." In other words,

13 the loop data relied on by SBC to estimate its loop costs, including DS-1 costs, do not

14 include many of the DS-1 loops for which SBC is actually producing costs results.

15 **Q.   HOW HAVE YOU CORRECTED SBC'S COST STUDIES TO INCORPORATE**

16 **THE FULL UNIVERSE OF SBC'S LOOPS?**

The documentation for this analysis is included in the directory March 31, 2003 Transcript request in Attachment BFP/SET-2.

[102] Direct Testimony of James R. Smallwood On Behalf of SBC Illinois, Before the Illinois Commerce Commission, December 23, 2002, p. 25 (hereafter "*Smallwood Direct*").

1   A.   We have relied on the LEIS database, which is the same source SBC relied on for use in

2   the LoopCAT filed in its recent Texas and California proceedings. Since LEIS reflects

3   the full universe of loops (or a much more complete universe of loops) than the ARES

4   database, it is superior to SBC's use of the loops in the ARES database. Further, SBC

5   should not object to the use of LEIS in developing its cost study inputs because SBC

6   itself relied on LEIS in this proceeding to identify its embedded fill factors. Moreover,

7   SBC has relied on LEIS in the past two UNE proceedings in Texas and California.

8   For these reasons, we have relied on the LEIS data as the basis for the loop makeup

9   information input into LoopCAT.

10   Q.   **DID YOU MAKE ANY ADJUSTMENTS TO THE LEIS DATA BEFORE**

11   **RELYING ON IT AS AN INPUT TO THE LOOPCAT?**

12   A.   Yes. We have made several adjustments that impact how the LEIS data flows into the

13   LoopCAT study. Two of the adjustments impact the underlying data that is used in the

14   Preprocessor and two of the adjustments impact the way in which the PreProcessor is

15   used to combine the data for use in the LoopCAT. Specifically, the preprocessing

16   methodology should be modified to:

17   • Eliminate loops with *distribution* lengths greater than 18,000 feet;

18   • Reflect UNE-specific loop lengths;

19   • Select the correct copper gauging;

20   • Process the loop sample data by wire center rather than rely on data aggregated at

21   the zone basis.

1   **Q   WHY DID YOU ELIMINATE LOOPS WITH DISTRIBUTION LENGTHS OVER**

2   **18,000 FEET?**

3   A.   SBC makes much of the assertion that its study reflects a "real" network based on "real"

4   data. Neither assertion is correct. Indeed, as we show in the remainder of this section,

5   SBC's study does not reflect the "actual" distribution length of any loops in its network

6   (except by accident). Moreover, SBC's gross assumptions regarding copper distribution

7   lengths are so poorly conceived that *****BEGIN PROPRIETARY   END**

8   **PROPRIETARY***** loops in ARES exceed 18,000 feet.[103] Thus, these loops (which

9   SBC includes in its supposed forward-looking study, *would not provide an acceptable*

10   *level of POTS service.*

11   There are two primary concepts used in copper cable transmission design. The first is the

12   signaling limit of the loop. A simple way to think of this concept is that the longer the

13   copper cable, the more resistance is incurred in passing signals across that cable.

14   Resistance is measured in ohms. Modern switches are designed to sense signals at a

15   maximum resistance of 1,500 ohms. Moreover, SBC's engineering practices and the

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[103] The file showing these loops is included in the directory " ARES Loops over 18000 Feet" in Attachment
BFP/SET-2. I understand that the ARES distribution lengths reflect ½ of the maximum distribution length in each
distribution area. Thus, any loop with a reported length has a maximum distribution length in excess of 18,000 feet,
violating forward-looking design standards.

1   LoopCAT studies recognize the maximum resistance of ***** **BEGIN PROPRIETARY**

2   **END PROPRIETARY *** ohms on 2-wire analog loops.[104]

3   The second important concept in copper cable transmission design affects loudness, as

4   measured in dB loss.[105] The principle is that the longer the copper cables, the greater the

5   loss of loudness on those cables. One of the factors that can change to lessen the loss

6   across long cables is to attach load coils onto the copper cable. The standard in the

7   industry is that if a copper loop exceeds 18,000 feet in length, then load coils must be

8   inserted in the line. This concept is reflected in SBC's engineering practices[106] -- which

9   conform to generally accepted industry practice.[107]

10   To summarize proper transmission design criteria for an 8 dB UNE loop (which

11   represents the most generic form of loop used to provide local service), there can be no

12   copper loop length longer than 18,000 feet (to preclude the use of load coils), and copper

13   cable gauging must be based on the proper application of a resistance design formula

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[104] Attachment BFP/SET-10, *SBC Loop Deployment Guidelines*, Section 3, p. 1.

[105] The frequently used term dB actually stands for decibel, or one-tenth the loudness of one bell.

[106] Attachment BFP/SET-10, *SBC Loop Deployment Guidelines*, Section 3, p. 6: **BEGIN PROPRIETARY
END PROPRIETARY ***

[107] The parties agree that the use of load coils obsolete, and therefore inconsistent with forward-looking principles.

1   based on copper feeder (or copper stub cable) distance plus the maximum total copper

2   loop length within a distribution area.

3 **Q.**   **GIVEN THESE FACTS, DOES SBC STILL FAIL TO SATISFY ITS OWN**

4   **ENGINEERING STANDARDS IN ITS COST STUDIES?**

5 A.   Yes. Although there is agreement on the engineering principles used in designing

6   forward-looking copper-served loops, there are significant problems with how LoopCAT

7   implements these engineering principles. LoopCAT is flawed in that it violates both the

8   resistance and loss engineering criteria described above. Specifically, SBC has relied on

9   distribution lengths of copper loops that greatly exceed 18,000 feet on loops that are

10   served through fiber-fed DLC. Based on our analysis, *****BEGIN PROPRIETARY**

11   **END PROPRIETARY ***** loops are in distribution areas

12   that have copper lengths greater than 18,000 feet. Moreover, this count does not include

13   copper feeder stub length that would cause more of the loops to exceed the 18,000-foot

14   technical limit.[108]

15   In order to accurately reflect forward-looking costs, only loops that comply with forward-

16   looking design standards should be included in the cost study. Any other approach would

1   artificially inflate the cost of loops by relying on longer lengths and would artificially

2   inflate the cost of the cable associated with those loops by using coarser gauge cable

3   (which is more expensive) that would be required for the forward-looking loop.

4   Therefore, we have eliminated any loops with *distribution* lengths greater than 18,000

5   feet from consideration in LoopCAT.

6 **Q**   **WHY HAVE YOU ADJUSTED THE SAMPLE DATA TO RELY ON THE**

7   **SPECIFIC LOOPS BEING STUDIED?**

8 A.   The TELRIC methodology requires that the costs for the network elements reflect the

9   specific underlying cost characteristics of the facilities required to provide the services.

10   This Commission has identified distinct services (or UNEs) for which we are developing

11   costs in this proceeding. Thus, it is necessary to accurately reflect the cost characteristics

12   and differences among these various services.

13 **Q**   **IS THIS DATA NECESSARY TO ACCURATELY REFLECT THE COSTS OF**

14   **UNES THAT SBC WILL BE PROVIDING?**

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[108] Feeder stub is a copper facility extending from the DLC out to the FDI where distribution begins. In determining copper loop length for transmission design characteristics, the total copper length includes the footage for the feeder stub as well as the distribution.

1   A.   Yes. The FCC has directed that UNEs be deaveraged on a geographic basis. The FCC

2   and this Commission have further defined certain elements to be deaveraged.[109] Finally,

3   the FCC TELRIC rules require that the costs must reflect a reasonable projection of

4   demand to develop UNE costs:

5   §51.511 Forward-looking economic cost per unit.

6   (a) The forward-looking economic cost per unit of an element
7   equals the forward-looking economic cost of the element, as
8   defined in §51.505, divided by a reasonable projection of the sum
9   of the total number of units of the element that the incumbent LEC
10   is likely to provide to requesting telecommunications carriers and
11   the total number of units of the element that the incumbent LEC is
12   likely to use in offering its own services, during a reasonable
13   measuring period.[110]

14   These requirements cannot be satisfied unless we are able to determine with a reasonable

15   degree of certainty where the customers that actually purchase DS-1 services are located.

16   In other words, the only reason to use average customer location data (which the loop

17   data represents as a proxy) is if one expects this projected demand over the next few

18   years to vary dramatically from where those services are currently being purchased. SBC

19   has made no such suggestion, much less provided any evidence, to suggest that the

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[109] *Local Competition Order*, ¶¶ 758-795.

[110] 47 C.F.R. § 51.511.

1   projected customer demand will be significantly disproportionate to existing customer

2   demand.

3   Unfortunately, SBC has successfully prevented us from gaining access to this necessary

4   information. Therefore, we have not been able to reflect these cost differences in our

5   current restatement of the LoopCAT but are continuing to investigate alternative

6   approaches to reflect these real-world cost differences.

7 **Q**   **HAVE YOU MODIFIED THE PREPROCESSOR TO REFLECT APPROPRIATE**

8   **GAUGING?**

9 A.   Yes. Despite SBC's proclamations, LoopCAT does not really use actual loop lengths.

10   Instead, LoopCAT computes loop length by using (1) actual *feeder* lengths in the

11   embedded base, as indicated in SBC's ARES outside plant planning systems, and (2) the

12   "maximum distribution length" for the distribution portion of the loop. However, the

13   loop information extract from ARES cuts the maximum distribution length in half.

14   Therefore, the loop length data in LoopCAT *do not* reflect actual embedded loop lengths

15   that exist in SBC's wire centers.

16   Once these data are loaded into LoopCAT, the cost study evaluates whether the total loop

17   length (feeder + distribution) is greater than 12,000 feet. If the loop length is less than

18   12,000 feet, the loop is assumed to be 100% copper in LoopCAT. Loops that have a total

19   loop length greater than 12,000 feet, however, are assumed to be served by a mixture of

20   fiber feeder, DLC, copper feeder stub cable, and copper distribution cable.

1   Fiber-fed loops with DLC provide a new copper loop length starting point at the DLC-

2   RT.[111] It now becomes critical for LoopCAT to determine the new maximum copper loop

3   length to ensure that the signaling and dB loss limits are not exceeded.[112] However, the

4   LoopCAT PreProcessor is not capable of correctly performing these calculations and, as

5   we described above, we eliminated loops with distribution areas greater than 18,000 feet

6   to appropriately reflect forward-looking design criteria.[113]

7   In addition to the serious transmission engineering errors identified above, SBC has also

8   incorrectly developed the loop cost in LoopCAT using inaccurate resistance guidelines.

9   As discussed earlier, SBC's engineering guidelines call for the use of ***** BEGIN**

10   **PROPRIETARY   END PROPRIETARY ***** ohms of resistance in the design of

11   copper loops, but SBC inappropriately uses a ***** BEGIN PROPRIETARY   END**

12   **PROPRIETARY ***** ohm guideline instead.

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[111] "Fiber-fed loops with DLC" are made up of copper distribution cable that is connected back to DLC. DLC provides the electronics that allows for multiple loops to be concentrated onto fiber based transmission paths back to the central office. The DLC in combination with the fiber acts as a substitute for the use of 100% copper feeder facilities.

[112] In addition, LoopCAT will incorrectly determine wire gauge because its calculations for resistance design are not based on the "design point" copper distribution cable distance, but on only half that distance. LoopCAT therefore violates the signaling limit because longer-than average loops in some distribution areas will exceed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** ohms.

[113] See SBC Illinois Response to AT&T Data Request BFP-317.

1   The impact on loop cost from using ***BEGIN PROPRIETARY   END

2   PROPRIETARY *** ohms instead of *** BEGIN PROPRIETARY

3   END PROPRIETARY *** ohms is straightforward. In a deposition, SBC's California

4   engineering witness, Cheryl Bash, agreed that the use of LoopCAT's *** BEGIN

5   PROPRIETARY   END PROPRIETARY *** ohm design criteria results in a 4.8

6   dB UNE loop, not an 8.0 dB loop.

7   Q.   Are you familiar with the technical term dB loss?

8   A.   Familiar with, yes.

9   Q.   And, are you aware that one of the rate elements that we
10   are looking at in this proceeding is an 8 dB loop?

11   A.   Yes.

12   Q.   Would you consider an 8 dB loop as a POTS loop,
13   generically speaking, without going deeper than that?

14   A.   I would have to review that, but probably.

15   Q.   But there is a rate element called an 8dB loop in the
16   proceeding, you are aware of that?

17   A.   Yes.

18   Q.   In the case where there is no more than 9 thousand feet of
19   26 gauge or 12,000 feet of 24 gauge, is that an 8 dB loop?

20   A.   I don't know.

21   Q.   Is a lower number on the dB scale better or worse?

22   A.   Better.

23   Q.   Would you accept subject to check that such a loop of those
24   lengths at those gauges would be about a 4.8 dB loop?

25   A.   I really don't know. I would have to go back and verify
26   those numbers.

1   MR. DONOVAN: I'd like to mark this as Exhibit No. JA 5.

2   (Exhibit was marked for identification by the reporter and is
3   attached hereto.)[114]

4   Q.   BY MR. DONOVAN: Ms. Bash, let me ask you   generally
5   and you can use this chart if you wish. Does this chart help you to
6   answer my question as to whether the 9 thousand feet of 26 gauge
7   copper loop ends up giving you about a 4.8 dB loop?

8   A.   Yes, it does.[115]

9   From a practical standpoint, when copper loops are designed at ***** **BEGIN**

10   **PROPRIETARY**   **END PROPRIETARY ***** ohms instead of ***** BEGIN**

11   **PROPRIETARY**   **END PROPRIETARY ***** ohms, the probability of having

12   coarser (and more costly) gauge cable becomes greater. As a result, SBC's LoopCAT

13   generally overstates the cost for distribution because it does not apply design criteria

14   consistent with its engineering guidelines.

15   **Q.   HAVE YOU MODIFIED THE PREPROCESSOR TO CORRECT THE**

16   **OVERSTATEMENT IN SBC'S LOOPCAT PREPROCESSOR?**

17   A.   We modified the LoopCAT to use a ***** BEGIN PROPRIETARY   END**

18   **PROPRIETARY ***** guideline rather than the ***** BEGIN PROPRIETARY   END**

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[114] *Bash California Deposition*, 11/12/02, pp. 72-73.

[115] Id., p. 81.

1   **PROPRIETARY ***** ohm guideline with which SBC populates the PreProcessor. This

2   standard more closely matches SBC's own internal guidelines. AT&T and other

3   competitors should not be paying higher UNE rates because SBC's cost studies are

4   incapable of using the correct input.

5 **Q**   **WHY DID YOU DECIDE TO USE LOOP SAMPLES BY WIRE CENTER**

6   **RATHER THAN BY ZONE?**

7 A.   As we discuss in greater detail below, the LoopCAT should be run at the most granular

8   level available to allow for a more disaggregate level of costing for each UNE. We chose

9   to run the LoopCAT at the wire center level of detail because that is the most discrete

10   level of detail in which SBC has provided its underlying loop counts by UNE. In other

11   words, the cost study should be run at a disaggregate level so that the loop costs in each

12   defined area can be matched with the quantity of loops (for each specific UNE) in each

13   area. This approach helps ensure that underlying cost characteristics for different UNEs

14   are not averaged together, thereby skewing deaveraged costs between zones or UNEs.

15   For example, consider the development of statewide average DS-1 rates (we are aware

16   that the purpose of this proceeding is to develop deaveraged rates, but we are using the

17   notion of statewide average costs for illustrative purposes). Each wire center will have a

18   specific and unique cost based on the distribution length, feeder length, customer

19   demand, etc. However, each wire center will also have a unique mix of services provided

20   by SBC. For example, the more urban wire centers will have a large percentage of high

21   capacity loops, such as DS-1 loops. In contrast, some rural wire centers may not have

1   any (or at least have very few) DS-1 lines.[116] By using the total number of all loops in

2   that wire center, the cost study would assume that those wire centers should be given

3   much more weight in developing the cost of a DS-1 loop than it otherwise should.

4   In other words, the purpose of developing deaveraged costs for different UNEs is to

5   reflect the cost characteristics of those particular UNEs. As a result, most models

6   (including the FCC's Synthesis Model) develop costs at a much more discrete level and

7   then aggregate the costs to the zone level based on the amount of each specific element at

8   issue the more discrete level of detail. This provides a very different result than

9   performing the cost calculations, as the starting point, at the zone level. SBC should not

10   be allowed to skew the costs of specific UNEs by avoiding the more detailed costing

11   approach it used in the recent California UNE proceeding.

12   Therefore, we have used the LoopCAT to develop loop costs by wire center and then

13   used the line counts SBC provided by wire center to correctly weight the UNE rates

14   based on the number of relevant UNEs in each wire center.[117] By doing this, we are more

15   accurately developing the deaveraged UNE rate for each element at issue in this

16   proceeding.

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[116] Data provided by SBC Illinois Response to AT&T Data Request BFP-1 shows that *** **BEGIN PROPRIETARY   END PROPRIETARY** *** wire centers have only one DS-1 line.

1   **F.   The LoopCAT Improperly Calculates Costs Associated With Premises**
2   **Termination Equipment**

3 **Q.   ARE THERE ANY OBVIOUS INDICATIONS THAT PREMISES**

4   **TERMINATION EQUIPMENT IS SUBSTANTIALLY OVERSTATED?**

5 A.   Yes. As we previously discussed, LoopCAT generates investments for premises

6   termination comprised of *****BEGIN PROPRIETARY   END**

7   **PROPRIETARY ***** in distribution cable *and* associated structure despite the fact that

8   premises termination investments should be a much smaller overall portion of investment

9   than is distribution cable.[118] By way of contrast, the FCC's Synthesis Model for SBC's

10   Illinois territory estimates premises termination investments that are approximately 17.3

11   percent of distribution investments. This significant disparity between LoopCAT and the

12   FCC's cost study (which was based on years of evaluation by the FCC and input from a

13   wide variety of industry participants) exemplifies the absurdity of the results LoopCAT

14   produces.

15 **Q.   WHAT ARE THE MAJOR FACTORS THAT CONTRIBUTE TO THE DRASTIC**

16   **OVERSTATEMENT OF PREMISES TERMINATION EQUIPMENT?**

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[117] *See*, SBC Illinois Response to AT&T Data Request BFP-1.

[118] *See,* "IL 2w Analog LoopCAT 02-05_Prem Term.xls" in Attachment BFP/SET-2.

1   A.   Above, we have already discussed the overstatement that results from SBC's reliance on

2   linear loading factors to calculate premise termination investments. In restating these

3   inputs to reflect specific pieces of equipment and costs, we adjusted the LoopCAT to use

4   more appropriately sized equipment. Further, we corrected SBC's LoopCAT to account

5   for the existence of MDUs and to reflect the economies associated with serving these

6   locations. Even with these adjustments, however, the LoopCAT still overstates the

7   premises termination investments in the following ways:

8   • SBC inappropriately assumes an unrealistically high percent of residential

9   terminations for services that rarely terminate at such locations.

10   • SBC relies on unsupported inputs to identify the mix of aerial and buried premises

11   termination equipment rather than relying on the mix used in the distribution

12   portion of the network.

13   • SBC uses inappropriate assumptions for building entrance facilities.

14   **Q.**   **WHAT IS WRONG WITH SBC'S MIX OF RESIDENTIAL AND BUSINESS**

15   **PERMISES TERMINATIONS?**

16   A.   In many instances, SBC has populated the LoopCAT with the same inputs regardless of

17   the type of service being provided (*e.g.*, POTS, coin, DS-1). This is particularly

18   problematic when SBC uses the same inputs to generate costs for certain UNEs that are

1   predominately associated with business locations rather than residential locations. From

2   a cost perspective, this is troubling because the average costs per line of terminating

3   loops at a residential location are typically more than two times greater than the average

4   costs per line of terminating loops at business locations.[119] The primary reason for the

5   significant cost differential relates to the deployment of less expensive block terminals

6   (on a per-line basis) compared with more expensive (on a per-line basis) NIDs. In short,

7   overweighting residential related costs results in higher overall UNE costs.

8   Consider, for example, a 4-wire analog loop. 4-Wire Analog loops allow for separate

9   transmission and receive paths on the two pairs that make up the 4-wire analog loop. As

10   such, 4-wire analog loops are used in specialized low-speed data applications (lower than

11   DS-1 speed) that require separate transmission paths and would rarely be used in

12   residential applications. Specifically, SBC has provided the following description for 4-

13   wire loops:

14   A 4-wire Analog Interface loop facilitates transmission of voice
15   grade signals using separate transmit and receive paths and
16   terminates in a 4-wire electrical interface at the
17   telecommunications carrier's end user's premises and a 4-wire
18   electrical interface at the company's central office frame. It can be
19   used for voice transmission or analog data transmission at speeds
20   of up to 9.6 kbps. 4- wire Unbundled Loops are used for larger

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[119] For all three zones, the average unit investment of the aerial and buried residential premise termination is twice as much as the average unit investment of the aerial and buried business premise termination in the LoopCAT.

1   and faster transmission of data such as ATM machines, lottery
2   network, etc.

3   A 4-wire analog loop provides a non-signaling voice band
4   frequency spectrum of approximately 300 Hz and 3000 Hz, using
5   separate transmit and receive paths.[120]

6   In light of the services typically provided over 4-wire analog loops, SBC's inputs for this

7   UNE are unreasonable. Specifically, SBC assumed that ***** BEGIN PROPRIETARY**

8   **END PROPRIETARY ***** percent of the 4-wire analog loops would terminate

9   at residences.[121] This is the same percentage that SBC assumed for 2-wire analog loops,

10   the vast majority of which terminate at residential locations.[122] It is simply implausible

11   that SBC would have the same percentage of 4-wire analog loops terminating at

12   residences as it has 2-wire analog loops terminating at residences. A more realistic

13   assumption, for the purpose of estimating costs, is that a *de minimis* amount of 4-wire

14   analog loops terminate at residential locations. We have therefore adjusted the cost study

15   to assume that all 4-wire analog loops terminate at business locations.

16 **Q.**   **WHAT IS WRONG WITH SBC'S MIX OF AERIAL AND BURIED PREMISES**

17   **TERMINATIONS?**

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[120] *See*, SBC Illinois Response to AT&T Data Request BFP-227.

[121] IL 4W Analog LoopCAT 02-05.xls.

[122] IL 2w Analog LoopCAT 02-05.xls , Expanded_Summary Worksheet, Sum of Cells G13 and G14.

1   A.   SBC uses an assumed mix of aerial and buried NIDs and drops in developing the

2   premises termination investments. SBC provides no justification for the mix it uses in

3   LoopCAT. For example, LoopCAT assumes that *** **BEGIN PROPRIETARY**

4   **END PROPRIETARY** *** of drops in suburban zones are aerial and the remaining ***

5   **BEGIN PROPRIETARY   END PROPRIETARY** *** are buried. However, this

6   makes no sense given that LoopCAT also assumes that *** **BEGIN PROPRIETARY**

7   **END PROPRIETARY** *** percent of distribution cable in suburban areas is aerial

8   cable. In order for LoopCAT's mix of aerial and buried drops in rural areas to be correct,

9   aerial distribution cable would need to be placed below ground about one-third of the

10   time to run the drop. This would seldom occur, especially since the customer would be

11   forced to arrange for and pay for such excavation work prior to filing a special request to

12   SBC.

13   It is more appropriate to assume that aerial distribution cable will use aerial drops and

14   buried distribution cable will use buried drops. The best way to correct the error in

15   LoopCAT is to restate SBC 's premises termination aerial/buried mix to reflect the same

16   mix as its aerial/buried distribution cable facilities. We implemented this approach in our

17   restatement of LoopCAT.

18   **Q.   HOW ARE BUILDING ENTRANCE FACILITIES MISSTATED IN THE**

19   **LOOPCAT?**

20   A.   SBC has erroneously included the building entrance facilities costs in all business

21   locations and excluded the building entrance facilities costs from certain residential

1   premise terminations.   Building entrance facilities are only used when a block terminal

2   is present; they are not used when a NID and drop wire is present.[123] For business

3   premise terminations, SBC assumed a cost for building entrance facilities 100 percent of

4   the time, meaning that the approximately ***** BEGIN PROPRIETARY   END

5   PROPRIETARY ***** percent (varying by zone) of business premise terminations

6   utilizing NIDs and drop wires are assumed to have building cable as well, thus

7   overstating costs. In our adjustments, we recalculated this to apply the cost of a building

8   entrance facility only when a block terminal is used.

9   Additionally, SBC's LoopCAT did not assume building entrance facilities at all for

10   residential premise terminations. This is correct only if one assumes that residential

11   premise terminations are equipped with NIDs and drops all of the time. However, this

12   assumption is incorrect and we have modified the LoopCAT to include building entrance

13   facilities for MDUs with block terminals.

14

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[123] *See*, SBC Illinois Response to AT&T Data Request BFP-497.

1   **G.   SBC's Copper Cable Investments Are Incorrect**

2   **Q.   WHY ARE SBC'S COPPER CABLE INVESTMENTS INCORRECT?**

3   A.   The copper cable investments in LoopCAT are incorrect because they are based on

4   flawed expert opinion assumptions. Specifically, SBC subjectively allocates copper

5   cable to distribution or feeder facilities. However, SBC's experts did not incorporate in

6   their assumptions any variations based on structure type or density, which is wholly

7   unrealistic. In addition, SBC also inappropriately calculates the mix of structure types for

8   copper facilities by failing to recognize and adjust for multiple sheaths along a single

9   route.

10 **Q.   HOW DO YOU KNOW THAT THE EXPERT OPINION ASSUMPTIONS ARE**

11   **FLAWED?**

12 A.   SBC has chosen to use its embedded mix of cable sizes in LoopCAT. As a threshold

13   matter, reliance on embedded cable distances and cable sizes which may have become

14   obsolete and inefficient due to, *e.g.*, an increase in scale that occurred decades ago.

15   SBC's approach creates the further problem of having to allocate those cable sizes to

16   distribution and feeder plant rather than determining, route by route, the appropriate mix.

17   To perform this allocation, SBC uses undocumented, unsupported ratios to associate each

18   cable size with either distribution or feeder facility.

19   SBC's allocation inputs are obviously wrong because the allocations of feeder and

20   distribution facilities do not change by either structure type or by density zone, as they

1   should in a properly performed TELRIC analysis. Because there is no backup material

2   supplied or explanation of the process SBC used to develop its inputs, we cannot pinpoint

3   the source of the error or even understand SBC's logic for such an assumption. However,

4   it is clear that aerial cables, for example, should have a different mix of distribution and

5   feeder facilities than underground cable; and underground facilities, for example, should

6   have a different mix between distribution and feeder facilities in urban areas than in rural

7   areas.

8   The logic for these assumptions is straightforward. First, in practice, underground cable

9   is most often used in feeder facilities, and rarely occurs in distribution facilities.

10   Therefore, it simply makes no sense to use the same allocation between distribution and

11   feeder facilities for both aerial and underground facilities.

12   Also, the mix of aerial, buried, and underground cable changes significantly in different

13   density zones. For example, underground cable is much more prevalent in urban areas

14   than in rural areas, while aerial cable is less prevalent in urban areas and more prevalent

15   in rural areas. SBC's static inputs, however, do not reflect these differences by density.

16   In addition, distribution cables become larger in higher density zones. Thus, the

1   breakpoint between distribution and feeder facilities must be different for each density

2   zone. SBC's assumptions do not reflect this fact and cannot be relied on.

3   Finally, SBC's simplifying assumption that there would be no copper feeder cables under

4   300-pair in any situation and no copper distribution cables above 1,500-pair in any

5   situation,[124] is patently unreasonable.

6 **Q.**   **WHAT IS A MORE REASONABLE APPROACH TO ALLOCATING COPPER**

7   **CABLE BETWEEN DISTRIBUTION AND FEEDER FACILITIES?**

8 A.   SBC provided no data that explains how one could properly split embedded cable sizes

9   between distribution and feeder facilities. Thus, to correct for this problem in SBC's

10   LoopCAT, we have used more appropriate inputs that reflect the mix of distribution and

11   feeder facilities one would expect to see in actual practice. These estimates, detailed in

12   Attachment BFP/SET-11, appropriately reflect differences by type of structure (aerial,

13   buried and underground) and by density (rural, suburban and urban).

14

15 **Q.**   **WHY IS SBC'S APPROACH TO DEVELOPING STRUCTURE MIX**

16   **PERCENTAGES FLAWED?**

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[124] *See*, SBC Illinois Response to AT&T Data Request BFP-327.

1   A.   LoopCAT's calculation of copper cable investment is also flawed because SBC develops

2   its distribution mix based on embedded sheath feet rather than using forward-looking

3   plant mix assumptions. Moreover, even if one were attempting to use embedded plant

4   mix assumptions, SBC incorrectly uses its own embedded data. Specifically, SBC fails

5   to account for the fact that embedded base feeder facilities are more likely to have

6   multiple sheaths than distribution facilities. SBC also fails to consider that embedded

7   underground cable is more likely to have multiple sheaths along an individual route than

8   will buried facilities. This is because most underground cable is feeder plant that is

9   customarily augmented over time.[125]

10   However, in a forward-looking network, a feeder route will not have multiple sheaths

11   when a single sheath can be used. In short, SBC has failed to adjust the structure mix

12   assumptions by ignoring the fact that embedded aerial and underground cables are more

13   likely to have multiple sheaths on a single route than will buried cable. This error leads

14   to an unrealistically high proportion of underground distribution. The following table

15   summarizes the LoopCAT distribution cable plant mix.[126]

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[125] "Because of the high number of [feeder route] cables involved, and the need for periodic addition of cables, most below-ground feeder plants are in underground conduit structures for ease of placement and replacement." *Telcordia Notes on the Networks*, included as Attachment BFP/SET-2.

[126] The analysis supporting these calculations is contained in the directory titled "Testimony Figures" in Attachment BFP/SET-2.

1   **Figure 8**

2   **SBC'S MIX OF COPPER CABLE PLANT**

3   ***** BEGIN PROPRIETARY**

4

5

6

7

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9   **END PROPRIETARY *****

10   It is especially illogical to assume that ***** BEGIN PROPRIETARY   END**

11   **PROPRIETARY ***** of distribution cable in rural areas will use underground facilities.

12   Attempting to change the mix of cable plant in LoopCAT to reflect appropriate

13   engineering guidelines in a forward-looking environment is an ultimately futile effort

14   because LoopCAT's mix is based on a combination of embedded sheath distance data

15   (not route distance, as would be more appropriate) plus a series of allocations combined

16   with unexplained assumptions.

17   **Q.   WHAT IS A MORE REASONABLE APPROACH FOR DEALING WITH THIS**

18   **PROBLEM WITH SBC'S EMBEDDED DATA?**

19   A.   If one were going to rely on embedded data to estimate the appropriate forward-looking

20   mix (and generally one should not), it would be much more appropriate to estimate the

21   structure mix based on the amount of route miles instead of sheath miles. Therefore, we

1   have converted SBC's sheath distance into route distances. The number of sheaths per

2   route miles for underground facilities is approximately *****BEGIN PROPRIETARY**

3   ***** END PROPRIETARY**.[127] We estimate that there are, on average, *******

4   **BEGIN PROPRIETARY   END PROPRIETARY ***** aerial sheaths per route mile

5   and *** **BEGIN PROPRIETARY   END PROPRIETARY ***** buried sheaths per

6   route mile. The following table shows that applying even these embedded factors to

7   SBC's embedded sheath distances yields a much more reasonable structure mix than is

8   currently used in LoopCAT, although neither method is fully TELRIC compliant.

9   For example, after applying our adjustments, underground cable accounts for

10   approximately 3.5 percent of distribution facilities in rural areas instead of SBC's

11   proposed ***** BEGIN PROPRIETARY   END PROPRIETARY ***** percent.[128]

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[127] This is calculated by dividing the total number of sheath miles as reported in ARMIS by the total number of conduit trench miles as reported in ARMIS.

[128] The analysis supporting these calculations is contained in the directory titled "Testimony Figures" in Attachment BFP/SET-2.

1 **Figure 9**

2 **AT&T's Percentage of Total Copper Cable Mix by Structure Type and Zone**

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	Zone		
	1	2	3
Aerial	21.49%	77.72%	43.76%
Buried	1.93%	10.43%	52.78%
Underground	76.58%	11.85%	3.46%

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8   We corrected the LoopCAT to use these more reasonable assumptions to estimate the

9   amount of copper cable for each specific structure type.

10   **H.   SBC's Pair Terminations At The FDI Are Overstated**

11 **Q.   WHY ARE SBC'S PAIR TERMINATIONS AT THE FDI TOO HIGH?**

12 A.   As noted in the prior discussion, SBC has designed LoopCAT to assign ***** BEGIN**

13   **PROPRIETARY   END PROPRIETARY ***** FDI terminations per working

14   loop.[129] However, each working loop will actually only utilize two FDI terminations –

15   one on the feeder side of the FDI and one on the distribution side of the FDI. Put simply,

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[129] *See*, IL 2w Analog LoopCAT 02-05.xls at Tab - Expanded_Summary Worksheet, Cell F41.

1   this is only a one-to-one ratio of feeder terminations used per unbundled loop to

2   distribution terminations used per unbundled loop.

3   However, it has been common in the past to engineer the FDI in such a way that there are

4   more distribution pairs implemented per premises served than there are feeder pairs

5   implemented per premises served. Thus, when properly engineered, one would have

6   more than two FDI terminations per working loop included in the cost study to account

7   for this greater than one-to-one ratio. It would not be uncommon to have a ratio that was

8   somewhat higher than 2, which would help ensure that the unbundled loop cost study

9   recovers all of the cost of the FDI from the working loops.

10   SBC's cost assumption of ***** BEGIN PROPRIETARY   END PROPRIETARY**

11   ******* FDI terminations per working loop assumes a ***** BEGIN PROPRIETARY**

12   **END PROPRIETARY ***** ratio of distribution pairs terminating at the FDI to

13   feeder pairs terminating at the FDI. SBC may have used this ratio because an FDI is

14   often divided into either three or six panels.[130] From a costing perspective, it is important

15   that a cost study uses consistent data throughout the process. The connections per FDI

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[130] For example, it is possible, but not mandatory, to designate a center panel to be used in terminating feeder pairs while designating the two side panels for terminating distribution pairs.

1   are directly related to the amount of spare capacity one incorporates into its network and

2   must be consistent.

3   As we have previously discussed, we have incorporated Mr. Starkey's proposed fill factor

4   of 85% for distribution facilities and 90% for feeder facilities. In equivalent terms, this

5   translates into 1.1765 installed distribution lines for every one working line (or 17.65%

6   spare) and 1.1111 installed feeder lines for every one working line (or 11.11% spare).

7   With these two pieces of information, we can calculate the ratio of distribution pairs at

8   the FDI to feeder pairs at the FDI. Here, we develop a ratio of 1.1765 distribution

9   terminations for every 1.1111 feeder terminations placed into the FDI, or a ratio of

10   1.0588 feeder terminations to distribution terminations. Thus, each working line will

11   require 2.0588 terminations at the FDI, one feeder connection plus 1.0588 distribution

12   terminations for each feeder termination.[131]

13   There is one additional consideration that must be taken into account. SBC assumes that

14   feeder pairs would only be terminated in a center panel, but there is no engineering

15   reason why this must be so. In fact, with the above ratios, the only efficient approach is

16   to first fill up the center panel of the FDI with feeder pairs, and then utilize available

[131] Of course, this is the input into the cost study. The LoopCAT then separately applies a fill factor to the FDI
calculations that incorporate additional spare capacity in the FDI.

1   terminations on either the right or left panel to terminate additional feeder pairs. This is

2   sensible given that the ratio of distribution pairs to feeder pairs is far less than two-to-one.

3   Failure to use this approach would cause the center panel of the FDI to fill up but leave

4   nearly ***** BEGIN PROPRIETARY   END PROPRIETARY ***** of the

5   distribution terminations unutilized.

6   **I.   SBC'S LoopCAT Contains Several Errors That Overstate The Amount of**
7   **DLC Investment**

8   **Q.   WHAT ERRORS STILL EXIST IN SBC'S DEVELOPMENT OF DLC**

9   **INVESTMENTS?**

10   A.   SBC incorporates a number of errors in its development of DLC investments. These

11   errors substantially overstate the amount of DLC investment associated with the elements

12   at issue in this proceeding. First, SBC fails to reflect the discounts that will be in effect at

13   the time this order is issued (the period at which the TELRIC rates will go into effect).

14   Second, SBC fails to reflect the sharing of its DLC equipment investment with all of the

15   non-UNE services sharing that investment. Third, SBC fails to use integrated digital loop

16   carrier ("IDLC") as the preferred technology, a solution much more efficient than the

17   universal digital loop carrier ("UDLC") technology that SBC primarily uses in its cost

18   studies.

19   **Q.   WHAT IS THE APPROPRIATE DISCOUNT TO APPLY TO THE ALCATEL**

20   **EQUIPMENT INCLUDED IN THE COST STUDY?**

1   A.   SBC correctly uses its most recent contract price list with Alcatel as the basis for the

2   DLC material cost inputs into LoopCAT. However, SBC then fails to reflect the

3   discounts that will be in effect at the time TELRIC rates are set.

4   **Q.   HOW MUCH DOES SBC CURRENTLY PAY ALCATEL FOR DLC**

5   **EQUIPMENT?**

6   A.   SBC provided, in response to Discovery Request BFP-114, "an updated version of the

7   Exhibit B price list to the Litespan Purchasing Agreement [that] went into effect on

8   February 20, 2003." Thus, we have used this price list as the starting point for our

9   analysis.

10 **Q.   WHY DO YOU BELIEVE THAT A DISCOUNT SHOULD BE APPLIED TO THE**

11   **FEBRUARY 20, 2003 PRICE LIST?**

12 A.   In addition to the February 20, 2003 price list, SBC's contract with Alcatel calls for an

13   additional discount of ***** BEGIN PROPRIETARY   END PROPRIETARY *****

14   on top of the then-effective price list. Specifically, Amendment Number Three to the

15   *Purchasing Agreement* states that ***** BEGIN PROPRIETARY**

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1   **END PROPRIETARY *** [132]** As part of this extension, the

2   Amendment Number Three states that

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12   **END PROPRIETARY *** [133]**

13   From the above language, there should be no dispute that the first discount will be in

14   effect at the time TELRIC rates are set in this proceeding and should be included in the

15   cost study.

16 **Q.   ARE ADDITIONAL DISCOUNTS APPROPRIATE?**

17 A.   We believe that SBC receives additional discounts that should be taken into account in

18   setting UNE rates. The language in the Alcatel contracts and subsequent Amendments

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[132] Amendment Number Three To Purchasing Agreement No. 99007255 Between SBC Services, Inc. and Alcatel USA Marketing, Inc contained in the directory titled "Alcatel Agreement" within Attachment BFP/SET-2.
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[133] *Id.*

1   discuss, at great length, additional discounts that SBC receives. For example,

2   Amendment Number Three also discusses:

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11   **END PROPRIETARY ***** [134]

12   Further, a more recent agreement states the following:

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[134] *Id.*

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23   **END PROPRIETARY ***** [135]

24   The above language has several critical implications here. First, SBC's contracts with

25   Alcatel are extremely complex. Second, the terms reflected in the current contracts and

26   amendments are the result of a long-standing relationship between SBC and Alcatel.

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[135] Amendment Number Six To Purchasing Agreement No. 99007255 Between SBC Services, Inc. and Alcatel USA Marketing, Inc. contained in the directory titled "Alcatel Agreement" within Attachment BFP/SET-2.

1   Third, SBC receives other discounts, credits and equipment as part of its Alcatel contracts

2   that are not covered in the *** **BEGIN PROPRIETARY   END PROPRIETARY**

3   *** discount we previously identified.

4 **Q.   HAVE YOU INCORPORATED THESE ADDITIONAL BENEFITS INTO YOUR**

5   **ADJUSTMENTS TO THE LOOPCAT?**

6 A.   No. Despite our review of the Alcatel contracts and Amendments, we have been unable

7   to consolidate the multiple provisions of the contracts to recommend a specific

8   adjustment to the LoopCAT. Thus, we have conservatively only included the clear ***

9   **BEGIN PROPRIETARY   END PROPRIETARY *** discount identified in

10   Amendment Number Three but are continuing to review documents and data provided by

11   SBC relating to its cost for DLC equipment.

12 **Q.   DO YOU BELIEVE SBC HAS FAILED TO DEVELOP ITS DLC INVESTMENT**

13   **ACROSS TOTAL DEMAND?**

14 A.   Yes. SBC has calculated the investment per loop assuming that the only use for the

15   Alcatel Litespan 2000 series of DLC-RTs is for 2-wire analog voice services. The fact is

16   that the Alcatel Litespan 2000 equipment offers the ability to provide voice service and

17   DSL service across that single loop. One of the main reasons for the deployment of this

18   particular form of NGDLC remote terminal is to enable SBC to offer both voice and data

19   services. In other words, the Alcatel DLC-RT is not limited to just 2,016 unbundled

20   analog loops. The cost impact of this error is that SBC has inappropriately allocated all

1   of the common DLC-RT investment to voice services, which does not accurately reflect

2   the capability and use of the equipment.

3 **Q.   DO YOU HAVE ANY INDICATION OF WHAT THE PRECISE BREAKDOWN**

4 **OF VOICE AND DSL SERVICE PERCENTAGE SHOULD BE FOR THE DLC-**

5 **RT?**

6 A.   Yes. The Litespan 2016.9 DLC-RT has the capacity to terminate and provide voice

7   service to 2,016 2-wire loops. In addition, the Litespan 2016.9 DLC-RT is also able to

8   provide DSL service to 672 of those same 2-wire loops. These engineering based

9   assumptions lead to a conclusion that 75 percent (2,016 divided by the sum of 2,016 and

10   672) of the capacity of the DLC-RT should be allocated to voice services and the

11   remaining 25 percent of the capacity should be allocated to DSL services.

12 **Q.   WHY DO YOU BELIEVE IT IS APPROPRIATE TO REMOVE 25 PERCENT OF**

13 **THE DLC-RT COMMON EQUIPMENT?**

14 A.   There is no question that the shared costs should be borne by all of the services sharing

15   those investments.[136] The FCC addressed this issue directly in its *Local Competition*

16   *Order*:

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[136] All of the shared investments should be allocated to all of the services using those facilities. It is our
understanding that the time slot interchange is not used by the DSL services and should therefore be recovered
entirely from voice services.

1   Forward-Looking Common Costs. Certain common costs are
2   incurred in the provision of network elements. As discussed above,
3   some of these costs are common to only a subset of the elements or
4   services provided by incumbent LECs. Such costs shall be
5   allocated to that subset, and should then be allocated among the
6   *individual elements or services* in that subset, to the greatest
7   possible extent. For example, shared maintenance facilities and
8   vehicles should be allocated only to the elements that benefit from
9   those facilities and vehicles.[137] (*emphasis added*)

10   Moreover, the FCC's UNE pricing rules in 47 C.F.R. § 51.507 and § 51.509 for rate

11   structures unambiguously state this fact:

12   **§ 51.507 General rate structure standard.**

13   (a) Element rates shall be structured consistently with the manner
14   in which the costs of providing the elements are incurred.

15   (b) The costs of dedicated facilities shall be recovered through
16   flat-rated charges.

17   (c) *The costs of shared facilities shall be recovered in a manner*
18   *that efficiently apportions costs among users.* Costs of shared
19   facilities may be apportioned either through usage-sensitive
20   charges or capacity-based flat-rated charges, if the state
21   commission finds that such rates reasonably reflect the costs
22   imposed by the various users.[138]

23   (emphasis added)

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[137] *Local Competition Order*, ¶ 694.

[138] *Local Competition Order § 51.507.*

1   The bottom line is that the DLC systems that SBC deploys are used to provide both voice

2   and DSL services; therefore, the costs of those systems should be shared by both services.

3   DSL should be required to recover its fair share of these costs, which is derived from the

4   underlying capability of the Litespan 2000 system.

5   **Q. WHAT ALTERNATIVES COULD BE USED TO ENSURE THAT VOICE**

6   **SERVICES DO NOT PAY TOO MUCH?**

7   A.   One possible alternative to assigning 25% of the DLC costs to DSL services and the

8   remaining 75% to voice services is to identify the cost of more simplistic DLC systems

9   that do not have the capability to integrate DSL services. We expect that the costs of this

10   technology would be substantially less than the technology SBC is currently employing.

11   While this is one possible alternative, we believe that such an approach would violate

12   TELRIC principles because we would not be designing a network that allows the full

13   economies of scale and scope to be shared among all of the services SBC provides (*i.e.*,

14   spreading the common cost of shared equipment among all services using the facilities).

15   Therefore, we have reduced the DLC investments by 25% to properly apportion the costs

16   of the DLC systems among all of the various users of this equipment.

17   **Q. ON A RELATED NOTE, SHOULD THE COST STUDY ASSUME 100% IDLC**

18   **TECHNOLOGY?**

19   A.   Yes. The use of UDLC in developing unbundled loop costs is inconsistent with TELRIC.

20   SBC inappropriately assumes the historic and embedded DLC utilization within SBC's

21   network, with complete disregard for forward-looking technology. Specifically, SBC's

1   LoopCAT is based on *** **BEGIN PROPRIETARY   END PROPRIETARY *****

2   percent non-integrated UDLC, or less than *** **BEGIN PROPRIETARY   END**

3   **PROPRIETARY ***** percent IDLC.[139] DLC-based loops should assume the use of

4   integrated technologies in all cases because IDLC systems are more efficient and less

5   expensive. However, given the importance of this issue, we will briefly provide some

6   background.

7   DLC-RTs have two main configurations that can be used to interface loops served by a

8   DLC-RT into the network or a local switch – universal mode and integrated mode. Each

9   loop is multiplexed at the DLC-RT into a channel between the DLC-RT and the DLC-

10   COT so that it can be transmitted across the fiber. With UDLC, each loop is de-

11   multiplexed back down to an individual loop at the DLC-COT, converted back from a

12   digital to an analog signal (despite the fact that it will need to be reconverted to a digital

13   signal to enter the digital switch) and actually connects into the network or the local

14   switch as a 2-wire analog copper loop – no different from how an all-copper loop coming

15   from the field would interface into the switch. In an integrated mode, the loop is assigned

16   to a time slot (similar to multiplexing but more flexible) between the DLC-RT and DLC-

17   COT. DLC in an integrated mode requires less multiplexing and demultiplexing and

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[139] IL 2w Analog LoopCAT 03-06.xls at the "User_Input" tab, cell A27.

1   creates an opportunity to gain additional savings by taking advantage of a capability

2   known as concentration and by allowing for traffic engineering between the DLC-RT and

3   DLC-COT such that it is possible to assign 96 lines to each equivalent DS-1 between the

4   DLC-RT and DLC-COT (described as four-to-one concentration) or 144 lines to each

5   equivalent DS-1 between the DLC-RT and DLC-COT (described as six-to-one

6   concentration), further reducing the need for plug-in cards at the switch and at the DLC-

7   COT. In short, the use of integrated DLC-RTs is significantly more efficient than the use

8   of universal DLR-RTs and should be the exclusive DLC network configuration in an

9   efficient, forward-looking TELRIC network.

10 **Q.**   **IS IT POSSIBLE TO UNBUNDLE LOOPS SERVED VIA IDLC?**

11 A.   Yes. Incumbents such as SBC frequently claim that it is impossible to unbundle loops on

12   integrated DLC-RTs, claiming instead that integrated digital loop carrier systems are

13   connected directly into the digital switch. In this proceeding, SBC asserts "stand-alone

14   UNE loops cannot be efficiently unbundled in an IDLC platform."[140] This is simply not

15   true. Moreover, SBC's extreme assumption that UNE loops should bear the cost of a

16   UDLC arrangement is already contradicted by its discovery responses in this docket.

17   Given the fact that, as least as of the last available count, only 6% of SBC UNE loops are

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[140] *See*, SBC Illinois Response to AT&T Data Request BFP-386.

1   in a UNE-L arrangement and therefore need to be physically unbundled,[141] SBC's notion

2   that UNEs somehow require ***** BEGIN PROPRIETARY   END**

3   **PROPRIETARY ***** percent universal facilities to accommodate the 6% of UNE loops

4   is entirely baseless.

5   It is also important to note that SBC's engineering guidelines make reference to using

6   IDLC in its loop network. Specifically, *SBC's Loop Deployment Guidelines* documents

7   include several requirements related to the importance and benefit of IDLC in its

8   network. Thos guidelines provide as follows:

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13   .[142] **END PROPRIETARY *****

14   Additional information provided to SBC's engineers reflects other clear advantages of

15   IDLC and directs the engineers ***** BEGIN PROPRIETARY**

16   **END PROPRIETARY *****

17   ***** BEGIN PROPRIETARY**

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[141] *See*, SBC Illinois Response to AT&T Data Request BFP-1.

[142] *See*, Attachment BFP/SET-10, *SBC Loop Deployment Guidelines*, Section 5, p.5.

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14   **END PROPRIETARY *****

15   The bottom line is that IDLC is the most efficient alternative for utilizing the capabilities

16   of NGDLC. IDLC is the first choice for SBC's engineers with NGDLC deployment.

17   Consequently, IDLC and not UDLC should be utilized in developing the efficient,

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[143] See Attachment BFP/SET-10, *SBC Loop Deployment Guidelines*, Section 5, p. 3. Note that the reference to *******
BEGIN PROPRIETARY   END PROPRIETARY *** in this quote is precisely the same
capability that is described in the Telcordia *Notes on the Network* (Attachment BFP/SET-2) of multi-hosting through
a different interface group supported out of the NGDLC. In other words, SBC is willing to utilize this capability
when it needs to provide for ***** BEGIN PROPRIETARY   END PROPRIETARY ***** (*i.e.*, allowing
the NGDLC to connect to more than one SBC switch). However, SBC normally objects to allowing CLECs to use
this same capability to efficiently unbundle the DLC-RT.

[144] *See*, Attachment BFP/SET-10, *SBC Loop Deployment Guidelines*, Section 5, p. 2.

[145] *Id*, Section 7, p. 18.

1   forward-looking cost for unbundled loops.[146] UDLC is inferior to IDLC systems because

2   IDLC systems require that the circuit only be digitized once at the DLC-RT, instead of

3   converting the signal from analog to digital form on multiple occasions – as is required

4   by UDLC systems. Likewise, IDLC allows a carrier to aggregate individual DS-0 (voice-

5   grade) circuits into larger, more efficiently transported bandwidths (DS-1, DS-3, *etc.*). In

6   this manner, IDLCs reduce costs (because there is no need for digital/analog conversion

7   equipment like the DLC-COT and associated line equipment used by non-integrated

8   systems).

9   One need only compare the DLC investments per line for UDLC against the limited

10   percentage of IDLC presented by SBC in this proceeding to see the order of magnitude

11   difference in costs. The difference in cost between IDLC configurations and UDLC

12   configurations has to do with the cost of the DLC-COT. Even using all of SBC's

13   incorrect inputs, LoopCAT reveals central office investment of ***** BEGIN**

14   **PROPRIETARY   END PROPRIETARY ***** per UDLC line versus ***** BEGIN**

15   **PROPRIETARY   END PROPRIETARY ***** per IDLC line. *See* IL 2W Analog

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[146] SBC has also forced LoopCAT to disallow the use of IDLC for any services other than a 2-wire loop. While this assumption is incorrect, the structure of LoopCAT also fails to include any costs for DLC systems if a user attempts to alter this assumption.

1   LoopCAT 03-06.xls. This difference is significant and illustrates the need to incorporate

2   efficient, forward-looking IDLC technology into the cost studies.

3   **Q.   WHAT IS THE APPROPRIATE PERCENTAGE OF UDLC IN A FORWARD-**

4   **LOOKING ENVIRONMENT?**

5   A.   A forward-looking environment should utilize the most efficient technology available

6   and, as a result, UDLC systems should be eliminated. SBC's assumption of *** **BEGIN**

7   **PROPRIETARY**   UDLC **END PROPRIETARY ***** does not begin to reflect the

8   percentage of UDLC that should be present in their embedded network. In discovery,

9   SBC supplied data showing the total number of loops that require UDLC total *****

10   **BEGIN PROPRIETARY   END PROPRIETARY ***** of total loops.[147] As

11   such, a conservative calculation using SBC's own embedded data on stand-alone loops

12   results in a *** **BEGIN PROPRIETARY   END PROPRIETARY ***** maximum

13   amount of UDLC – a number far less than the *** **BEGIN PROPRIETARY**

14   **END PROPRIETARY ***** proposed by SBC.[148] Because UDLC is so much less

15   efficient that IDLC, reliance on such technology is inconsistent with TELRIC.

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[147] See SBC Illinois Response to AT&T Data Request BFP-1.

[148] We are unaware of SBC asserting that UDLC needs to be incorporated for any POTS services other than stand-alone UNE loops.

1 **Q.** **ARE THERE OTHER FLAWS WITH SBC'S DLC ASSUMPTIONS WITHIN**

2 **LOOPCAT?**

3 A. Yes. SBC incorrectly allocates shared facilities on a DS-0 equivalent basis. Specifically,

4 SBC calculates the common investment in DLC by spreading it across all possible DS-0

5 terminations. In the case of a 2-Wire Analog loop, the DLC common investment would

6 apply one unit of common investment. However, when SBC develops the cost for a DS-

7 1 loop in LoopCAT, SBC actually applies 24 units of common investment.

8 Mr. Smallwood, SBC's primary loop witness in this case, has previously acknowledged

9 that the 24 times investment gross-up as SBC chosen methodology is to "allocate the

10 common equipment cost for the particular type of loop you are costing:"

11 Q. For DS 1 it's done on a per DS 0 basis, per DS 0?

12 A. Well, the costs were originally stated on a per DS 0 basis and
13 you are grossing it up by 24 DS 0s in a DS 1 to get the per DS 1
14 common investment.

15 Q. So at least for that portion of the calculation, the DS 1 requires
16 24 times the investment as an analog loop or a POTS loop?

17 A. Yeah, I mean you have a cabinet that is capable of supporting
18 so many DS 0 loops, and that's going to consume, you know, 24 of
19 those DS0s as far as the common equipment goes. How many
20 services can be put in that cabinet.[149]

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[149] *Smallwood California Deposition*, 11/11/02, pp. 161-162.

1   However, SBC's loop engineering expert in the California, Ms. Bash, recognizes that this

2   assumption is inconsistent with the physical space used in the DLC-RT. Specifically,

3   Mrs. Bash testified as follows:

4   Q. Does a DS 1 card in a digital loop carrier system take up the
5   same space as a four line RPOTS [8 dB 2-wire loop] card?

6   A. The same physical space?

7   Q. Yes.

8   A. It takes one slot, yes.[150]

9   There are only 56 card slots in each Channel Bank Assembly (at 4 lines per card, this

10   equates to 224 POTS lines per Channel Bank Assembly). These same 56 card slots are

11   also capable of providing DS-1 service at one DS-1 per card. DS-1 loops require four

12   times the space in a DLC-RT as a 2-Wire Analog loop. This is because there are four 2-

13   Wire Analog loops that are served from a single plug-in card at the DLC-RT, where as in

14   the same space – a single plug-in card – is only capable of providing a single DS-1 loop.

15   As such, from a space standpoint, the DS-1 loop does not consume 24 times the capacity

16   of the 2-wire analog loop, but only 4 times the capacity.

17   **Q.   HOW SHOULD THE COMMISSION ACCOUNT FOR THIS PROBLEM?**

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[150] *Bash California Deposition*, 11/13/02, p. 187.

1   A.   The Commission should reject SBC's attempt to overstate the cost of its DS-1 services by

2   allocating 24 times the investment to those services. Instead, the Commission should

3   follow cost-causative principles and use an allocation factor of 4. This change is

4   implemented by modifying the "DS-0 Channel Capacity" input on the Yearly_Input

5   Worksheet of LoopCAT from 24 to 4.

6   **Q.**   **MOVING ON TO ANOTHER RELATED DLC SUBJECT, DOES SBC INCLUDE**

7   **THE APPROPRIATE AMOUNT OF DLC-RTS PER DLC-COT?**

8   A.   No. SBC's cost study relies on an arbitrarily low number of DLC-RTs per IDLC-COT.

9   Specifically, SBC's LoopCAT assumes that there are ***** BEGIN PROPRIETARY**

10   **END PROPRIETARY ***** DLC-RTs for each IDLC-COT. Given that current

11   IDLC technology is capable of handling five DLC-RTs for each DLC-COT, SBC's

12   approach overstates the cost of DLC-COT equipment. This assumption is more

13   problematic given that we have been unable to find support for this assumption anywhere

14   in SBC's LoopCAT documentation. We have modified the LoopCAT to more

15   appropriately reflect four DLC-RTs for each DLC-COT deployed, which is more

16   consistent with efficient outside plant deployment.

17   **J.**   **Other Required Adjustments Must Be Made Without Specific Supporting**
18   **Data**

19   **Q.**   **WHY MUST ADDITIONAL ADJUSTMENTS BE MADE WITHOUT SPECIFIC**

20   **SUPPORTING DATA?**

1   A.   There are several errors that exist in SBC's LoopCAT that are a direct result of SBC's

2   almost complete reliance on its embedded network. In many instances, there is now data

3   available that substantiate our specific adjustments. In other instances, SBC did not

4   provide the data necessary to make such adjustments. Despite this lack of data in some

5   cases, it is necessary to incorporate some degree of adjustment to ensure that the cost

6   studies account for these problems and, therefore, more closely reflect TELRIC costs.

7   **Q.**   **WHAT TYPES OF ADJUSTMENTS MUST BE MADE WITHOUT SPECIFIC**

8   **DATA?**

9   A.   The LoopCAT includes many of the inefficiencies of its existing data. Common sense

10   dictates that if a network was going to be redesigned today, with full knowledge of where

11   current demand is located, a company would be able to design and route the plant more

12   efficiently than what currently exists. This is because today's existing network is based

13   on the fact that it has been built by piece-meal construction. Furthermore, larger parcels

14   of land tend to be split, thereby allowing more rights of way for routing

15   telecommunications plant than would have existed twenty years ago. Following is a list

16   of additional adjustments that must be accounted for in arriving at TELRIC costs:

17   • LoopCAT must be adjusted to reflect greater efficiencies in outside plant routing;

18   • LoopCAT's distribution areas are too numerous and too small, requiring

19   adjustment to reflect more efficient design;

20   • LoopCAT must be modified to reflect utilization of larger pieces of equipment

21   than existed in the past;

1   • LoopCAT should be adjusted to reflect the efficiencies associated with controlled

2   environmental vaults ("CEVs");

3   • LoopCAT premise termination equipment reflects too many NIDs and too few

4   block terminals.

5   **Q.**   **HOW HAVE YOU ADJUSTED THE LOOPCAT TO REFLECT EFFICIENCIES**

6   **IN OUTSIDE PLANT ROUTING?**

7   A.   LoopCAT relies on embedded route miles of cable. This inappropriately overstates the

8   amount of cable that would be installed on a forward-looking basis and, therefore,

9   overstates TELRIC costs. This overstatement occurs for three reasons, all of which are a

10   function of the scorched node approach to calculating TELRIC costs that was adopted by

11   the FCC and upheld by the United States Supreme Court. First, in constructing outside

12   plant to meet known demand from scratch, one can size cable more precisely to meet

13   current demand and short-run anticipated demand growth. In contrast, the embedded

14   plant reflects more piecemeal construction of the network. Second, because we know

15   with certainty today where current customer demand is – and can project the location of

16   short-term growth in anticipated demand with relative certainty – we can use minimum

17   spanning tree routing and other algorithms to more precisely tailor cable routes to

18   minimize the overall cable feet required to meet that demand. Third, today's SAI and

19   DLC equipment can handle a larger number of lines per site than could much older

20   equipment installed years or even decades ago. This permits one to design larger

21   distribution areas, which significantly reduces costs for items such as DLC common

22   equipment, plus site acquisition and preparation for DLC-RT and FDI sites.

1   Specifically, newer DLC equipment can serve as many as 8,064 voice-grade lines. This

2   permits the design of distribution areas that are much larger than were possible even a

3   few years ago. Larger distribution areas also result in fewer feeder sheath miles of feeder

4   cable. SBC's reliance on embedded plant inventories – which were established when this

5   currently available forward-looking technology did not exist -- overstates the amount of

6   feeder cable and FDIs required in the forward-looking network to serve current customer

7   demand.

8   **Q.**   **CAN YOU PROVIDE ANY EXAMPLES OF WHY PLANT PLACED TODAY**

9   **WOULD YIELD EFFICIENCIES OVER PLANT PREVIOUSLY PLACED?**

10   A.   The FCC's TELRIC rules specifically require that the cost of UNEs be based on a

11   forward-looking, efficient network architecture, with the sole exception that the costs

12   should reflect the existing locations of SBC's central offices (generally referred to as the

13   "scorched node" approach). This aspect of TELRIC was explicitly challenged before the

14   U.S. Supreme Court. In response, the Court affirmed that TELRIC was properly based

15   on the use of hypothetical, more efficient routing of outside plant.[151]

16   SBC's fundamental premise – that whatever cable placement decisions it made in the past

17   (be it last year or 40 years ago) are efficient and forward-looking today – lacks any

1   foundation or support and violates the TELRIC approach at its root. This "if we did it, it

2   must have been right" approach permeates SBC's LoopCAT study. Of course, there

3   would be no need for proceedings such as this if forward-looking UNE costs could be

4   determined by simply totaling whatever is in an ILEC's books.[152]

5   The exclusive use of existing feeder routing is, by nature, common sense and simple

6   logic, not the most efficient design. Feeder routes follow major roadways, as a matter of

7   course. The existence of large parcels of land requires the routing of facilities around

8   these large parcels of land. As time goes on, large parcels of land are subdivided and

9   crisscrossed with roads, thereby providing many more opportunities for direct routing.

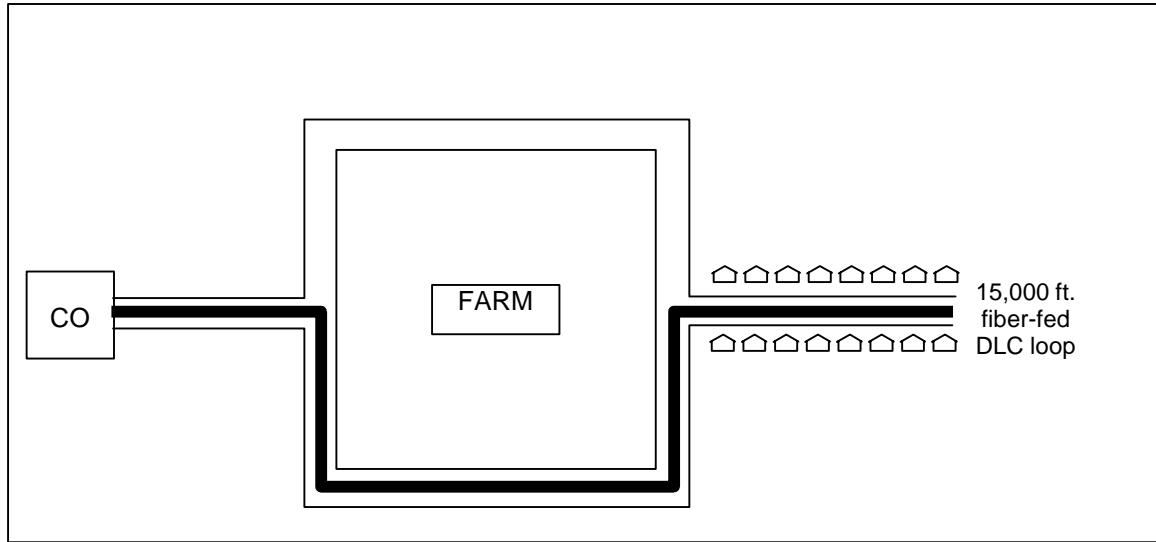10   The following figures illustrate this point.

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[151] *Verizon*, 122 S.Ct. at 2002.

[152] *Verizon*, 122 S.Ct. at 1667.

1 **Figure 10**

2 **Original Routing Diagram**

3

4   The first hypothetical example is a diagram of a feeder route encountering a land parcel

5   obstacle. In this case, the routing has forced the feeder loop length beyond 12,000 feet,

6   calling for fiber-fed feeder served by a DLC.

7   Although this situation may have existed many years ago, land parcels are frequently

8   subdivided for a number of reasons.[153] The above parcel could very well have been

9   subdivided, resulting in much shorter feeder routes. Moreover, the feeder route may be

10   short enough that DLC equipment may not even be required.

1 **Figure 11**

2 **Current Routing Diagram**

3
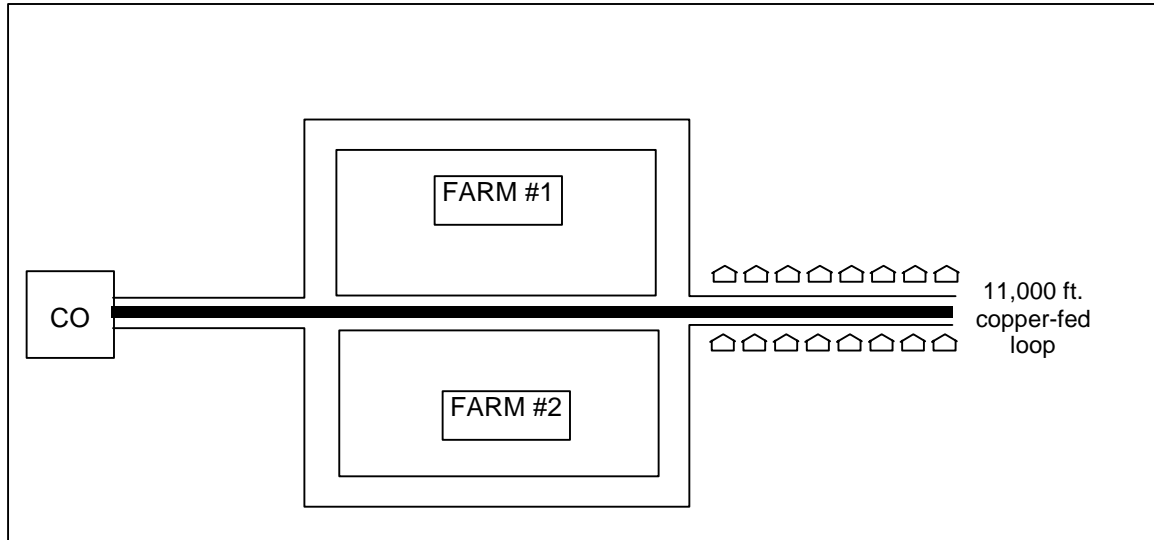
4 In the end, SBC cannot possibly have used efficient network design standards based on

5 its current customers and rights-of-way by blindly relying on its embedded data. In other

6 words, SBC's network sets the maximum distance that would be required to efficiently

7 route cables, but makes no adjustment to allow for efficiencies that can be realized today.

8 Although LoopCAT cannot account for a properly designed forward-looking network, we

9 reduced the length of distribution cable by 5% and the length of feeder and fiber cable by

[153] One frequent example is when a developer purchases larger parcels to subdivide and develop.

1   10% to estimate the effect of LoopCAT's overstatement of cable length in the

2   development of UNE costs.

3 **Q.**   **WHY DO YOU SAY THAT THE LOOPCAT INCLUDES TOO MANY**

4   **DISTRIBUTION AREAS THAT ARE TOO SMALL?**

5 A.   SBC defines distribution areas by collecting existing customer locations that are served

6   by existing FDIs – the interface point between feeder cable and distribution cable. The

7   small, embedded distribution areas used by LoopCAT define the embedded combination

8   of feeder and distribution cable lengths (and therefore the cabling distances) between an

9   SBC central office and its end-user customers. Thus, the LoopCAT studies do not permit

10   the user to determine and use efficient, forward-looking distribution areas.

11   Larger distribution areas that can take advantage of larger hardware sizes are more

12   efficient. This is recognized in SBC's engineering guidelines:

13   ***** BEGIN PROPRIETARY**

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16
17
18   154

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[154] *See*, Attachment BFP/SET-10 *SBC Loop Deployment Guidelines*, Section 8, p. 1.

1   **END PROPRIETARY *****

2   By assuming a fixed relationship between customer locations and specific distribution

3   areas, as they are reflected in SBC's embedded network, LoopCAT is inconsistent with

4   TELRIC because it seeks to "lock in" virtually all the embedded network, while TELRIC

5   requires that only the existing wire center locations remain fixed. SBC is therefore

6   improperly constraining one's ability to capture a more efficient forward-looking

7   configuration for serving existing demand.

8   This is particularly problematic because SBC's existing distribution areas are generally

9   very small and are based on embedded demand and dated, inefficient technology. By

10   "locking in" these inefficiently small distribution areas, SBC failed to recognize scale

11   economies that are achievable, on a forward-looking basis, at the FDI. Furthermore,

12   given the extensive use of DLC equipment in a forward-looking environment, SBC's use

13   of small distribution areas requires excessive feeder stub cables back to the DLCs.

14   Efficient forward-looking engineering calls for the use of larger distribution areas

15   consistent with the larger FDI and DLC equipment that is readily available.[155]

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[155] *See*, for example, 8,100-pair FDIs by manufacturer Marconi, Part Nos. FSDRLS8100-D, -DW, -DCF, -DCFW, -DDPM, and -DDPMW (http://www.marconi.com/media/RFP-0105.pdf) contained in the directory titled "Marconi FDI Documentation," in Attachment BFP/SET-2.

1   In short, properly developed TELRIC-based UNE prices should not be constrained by

2   specific embedded distribution area sizes that SBC may have selected decades ago. Yet,

3   SBC's LoopCAT takes these distribution areas as a given and has no capability to

4   calculate a more efficient, forward-looking configuration. The resulting costs that are

5   calculated from LoopCAT fail to provide the scale economies associated with an efficient

6   forward-looking network. LoopCAT instead incorporates inefficient engineering

7   practices by using such small distribution areas cabled back to a central DLC, effectively

8   generating three loop components – fiber feeder, copper feeder (stub), and distribution –

9   where only two would suffice.

10   **Q   HOW DOES SBC'S USE OF EMBEDDED DISTRIBUTION AREA SIZES**

11   **IMPACT EQUIPMENT COSTS IN LOOPCAT?**

12   A.   LoopCAT does not place FDIs based on efficient forward-looking engineering principles,

13   but simply "locks-in" SBC's embedded locations for FDIs. This issue directly affects

14   cost because the physical location of the FDI, in relation to both the customers in the

15   distribution area and the SBC central office, determines the lengths of the unbundled

16   loops. Because LoopCAT provides no mechanism to alter the embedded FDI placement,

17   the cable distance overstatements created by this problem (coupled with the sizing

18   inefficiencies discussed above) cannot be specifically corrected.

19   SBC's blind reliance on its embedded base affects more than the amount of equipment

20   placed. In addition to placing more FDIs than would be required under an optimally-

21   designed network, SBC's approach also undersizes each of the FDIs, even when an FDI

1   is appropriate. In other words, not only does SBC's embedded network have more FDI

2   sites than would be required in a forward-looking network, but each of those FDIs are

3   smaller than would otherwise be appropriate – thereby failing to reflect the economies of

4   scale in equipment sizes.

5   **Q.   HOW HAVE YOU INCORPORATED THE NECESSARY ADJUSTMENTS INTO**

6   **THE LOOPCAT TO REFLECT LARGER DISTRIBTUION AREAS AND FDIS?**

7   A.   As we have previously pointed out, LoopCAT is incapable of determining the appropriate

8   forward-looking sized distribution area, FDI, and corresponding sized DLC, where

9   appropriate. In an effort to quantify and correct for the effect this flaw has on UNE

10   prices, we made two reasonable adjustments to these inputs.

11   First, we modified SBC's FDI sizing to reflect the economic costs that would be incurred

12   if to reconstruct SBC's network today. Lacking sufficient information to do otherwise,

13   we assume that, overall, the forward-looking network would use the next largest FDI size

14   than is currently used. The table below demonstrates the adjustment that result to SBC's

15   embedded data.

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1   **Figure 12**

2   **Adjustment to FDI Sizes**

3

4   ***** BEGIN PROPRIETARY**

5

6   **END PROPRIETARY *****

7   The reality is that reliance on embedded distribution areas and routing prohibits a re-

8   clustering of customers into efficient, and larger, neighborhoods. Nonetheless, we know

9   that efficient forward-looking engineering parameters lead to larger FDIs than SBC is

10   currently using. The adjustment summarized above of moving to larger FDIs in SBC's

11   embedded count of FDIs will not solve this problem, but does apply some forward-

12   looking judgment to be considered in the costing process.

13   Second, feeder stub cables are not needed with larger FDIs because the distribution area

14   can be sized such that multiple FDIs will not be cabled back to a DLC. However, SBC

15   also uses embedded distribution area designs for the application of cable lengths in

1   LoopCAT. As such, larger distribution areas will likely lead to longer distribution

2   lengths. We therefore moved the feeder stub cable length into the distribution cable

3   length. Of course, this still uses SBC's one-size-fits-all feeder stub cable length, but

4   there is no information in LoopCAT that would permit the development of efficient

5   forward-looking distribution cable lengths assuming larger distribution areas. SBC chose

6   to design a study that made these inputs embedded, hard-coded, and not adjustable by the

7   user.

8   **Q.   WHY DOES THE LOOPCAT NEED TO INCLUDE LARGER EQUIPMENT**

9   **SIZES?**

10   A.   Clearly, in the construction of a forward-looking network, the logical approach would be

11   to place one larger piece of equipment whenever possible, instead of several smaller

12   pieces of equipment. Historically, SBC undoubtedly found it necessary to augment

13   equipment already in place, from time to time, with additional equipment to meet a

14   growing demand. This embedded effect is found throughout LoopCAT (as described

15   above in relation to distribution areas and FDI sizes) and results in inefficiencies that are

16   not consistent with forward-looking costs. The efficient practice of placing larger

17   equipment instead of multiple smaller pieces of equipment conforms to the principles of

18   TELRIC, and this practice should have been utilized in LoopCAT.

19   This systematic deficiency in LoopCAT is particularly problematic as it relates to cable

20   sizes. SBC bases all of its LoopCAT cable costs on its embedded base of cables. SBC

21   has not indicated how old those cables are, but it is possible that there are still cables in

1   inventory that were placed in service in 1930. In any case, SBC has incorporated

2   periodic reinforcements accomplished through the placement of multiple sheaths. On a

3   cost-per-pair basis, larger cables are more efficient (less expensive). Because SBC does

4   not attempt to determine route distances and the amount of cable required on each route,

5   it is simply impossible to modify the LoopCAT studies to appropriately reflect larger,

6   more efficient cables that are appropriate in a forward-looking cost study.

7   In an attempt to incorporate some amount of forward-looking reasoning into the costing

8   process, we shifted the cable sizes up to reflect larger average cable sizes by assuming

9   that 10% of each cable size shifted to the next largest size.

10   **Q.   WHAT IS YOUR CRITICISM REGARDING SBC'S FAILURE TO**

11   **INCORPORATE CEVS INTO THE LOOPCAT?**

12   A.   SBC completely fails to include CEVs in its cost study, despite the fact that CEVs are

13   cheaper, on a per-line basis, than DLR-RTs for large installations. Furthermore, the

14   evidence in this record makes it clear that SBC does in fact deploy CEVs in Illinois.

15   Most problematic is that SBC's prior filing of the LoopCAT in California did incorporate

16   CEVs and its cost studies in that proceeding reflected the additional economies associated

17   with such deployment.

18   **Q.   HOW DO YOU KNOW THAT CEVS ARE DEPLOYED IN ILLINOIS?**

19   A.   SBC provided, in response to data requests, documentation on its 10 largest outside plant

20   projects in Illinois over the past 2 years. Of the data that were produced, 5 of the 10

1   largest projects involved the placement of CEVs.[156] Despite its admitted existence, SBC

2   inappropriately and completely excluded this equipment from the LoopCAT.

3   This omission is notable given that SBC's own LoopCAT study in California included

4   CEVs and showed those CEVs to be less expensive (on a per-line basis) than DLC-RTs.

5   In California, we evaluated the impact of incorporating CEV's in SBC's own cost

6   studies. The public version of our Reply Testimony shows that the cost of a CEV is

7   lower than a DLC.

8   Given that CEVs are obviously used in SBC's Illinois network and that SBC agrees that

9   CEVs realize cost efficiencies, we have adjusted the LoopCAT to reflect the savings

10   associated with this equipment. Specifically, we have adjusted the LoopCAT to reflect a

11   10% cost savings for CEVs over DLC-RTs. We have also assumed that CEVs would be

12   deployed 50% of the time in Zone 1, 25% of the time in Zone 2, and not deployed in the

13   most rural zones. These assumptions result in a 5% reduction to DLC costs in Zone 1, a

14   2.5% reduction in Zone 2, and no reduction in Zone 3. To summarize, we made

15   necessary adjustments to the DLC investments to include the efficiencies that would

16   occur had SBC properly included CEVs in the LoopCAT for this proceeding. We have

17   used our best estimates to reflect these cost savings.

---

[156] *See*, SBC Illinois Response to AT&T Data Request BFP-111.

1   Q.   **HOW DOES SBC SET THE MIX OF BUSINESS EQUIPMENT SIZES FOR NIDS**

2   **AND BLOCK TERMINALS INCORRECTLY?**

3   A.   In LoopCAT, SBC provides what it calls the number of business "lines in-service" by

4   block terminal sizes, broken out by zone. These numbers are used to calculate the mix of

5   premises termination technology (NIDs or block terminals) and the mix of block terminal

6   sizes. To get these numbers, SBC used billing data to get the "total number of

7   businesses" and "total number of business lines" by zone and by block terminal

8   equipment size.[157]

9   However, SBC's reliance on billing data is faulty because these data do not recognize

10   that individual buildings house multiple businesses. In other words, there is an implicit

11   assumption that each business is in its own location, its own building. By way of

12   example, consider an office building that has 10 businesses, each with four lines. SBC's

13   methodology assumes that these are 10 separate locations, each served by its own NID,

14   instead of correctly placing one block terminal capable of accommodating all 40 lines. In

15   other words, SBC's methodology is flawed because it consistently skews the use of

16   smaller equipment that is less economical, thereby overstating costs.

---

[157] SBC Opening 12-23-02, AIT-Bus-Prim-Adl-Lines_IL 2002.xls workbook, Business worksheet, *See also*, SBC
response to data request BFP-312(b), included as part of Attachment BFP/SET-2.

1   To properly adjust for this error requires access to SBC's billing database. Because

2   AT&T was denied such access, we were forced to make a reasonable estimate as to how

3   the corrected lines in service should appear. We accomplished this by taking half of the

4   lines dedicated to each equipment (NID or block terminal) size in each zone and moving

5   those lines to the next highest equipment size. For example, SBC originally put *******

6   **BEGIN PROPRIETARY   END PROPRIETARY ***** lines into the Zone 1

7   6-pair NID. In our adjustment, we left ***** BEGIN PROPRIETARY   END**

8   **PROPRIETARY ***** of those lines in the 6-pair size, and moved ***** BEGIN**

9   **PROPRIETARY   END PROPRIETARY ***** of them into the 25-pair block

10   terminal size.

11   While the above methodology is admittedly not very precise, failure to reflect this

12   obvious overstatement would result in UNE rates that overstate true, forward-looking

13   economic costs.

14   **IV.   CONCLUSION**

15   **Q.   WHAT ARE YOUR OVERALL REACTIONS TO SBC'S LOOPCAT?**

16   A.   SBC has designed the LoopCAT to reflect, to the greatest extent possible, its embedded

17   network that has been built piece by piece over the past many decades. Such an approach

18   is in direct violation of the FCC's TELRIC approach. We have made every effort to

19   make reasonable forward-looking assumptions to bring SBC's LoopCAT more in line

20   with forward-looking design concepts using specific information where available.

1   However, we admittedly were forced to make approximations in many instances where

2   SBC refused to provide us the necessary information to make more specific adjustments.

3   Further, we detail that SBC has attempted to incorporate its embedded accounting data

4   into its cost studies rather than using the information it uses as part of its daily business

5   activities. In this way, SBC develops "regulatory inputs" that it does not use for any

6   other part of its business. We have proven that these regulatory inputs substantially

7   overstate the costs that its own engineers would estimate for new construction projects

8   and serve to overstate the resulting UNE rates. We also detail many ways in which SBC

9   employs methods that blatantly overstate costs – even when SBC's approach directly

10   violates the testimony of its own experts.

11   Our corrections to SBC's LoopCAT, which we detailed in our above testimony, bring the

12   LoopCAT more in line with the trend in telecommunications costs. In other words, our

13   corrections show that loop costs have declined since the ICC has last evaluated recurring

14   loop UNE rates. Not only is this exactly what one would expect (as opposed to what

15   SBC has proposed in this proceeding), this reflects the trend in recently adopted UNE

16   rates around the country. We are not aware of any recent Commission order in the entire

17   country that has increased UNE rates from where they previously stood.

18

1 **Q.** **WHAT ARE THE RESULTS OF YOUR RESTATEMENT OF THE RECURRING**

2 **LOOP RATES?**

3 A. The following table (which is provided in full on the following page) provides a summary

4 of the UNE rates that we are proposing. For reference, we have compared our proposed

5 UNE rates with the UNE rates currently in effect in Illinois and with the UNE rates

6 proposed by SBC in this proceeding.

7

1   **Figure 13**

2   **Comparison of UNE Rates**

Category	Current Rates	Proposed Rates	
		SBC-IL	AT&T
Unbundled Loops			
2W Analog Basic			
Area A - Metro	$ 2.59	$ 11.62	$ 1.24
Area B - Suburban	$ 7.07	$ 23.23	$ 2.94
Area C - Rural	$ 11.40	$ 26.85	$ 4.56
2W Analog PBX Grd Start			
Area A - Metro	$ 2.64	$ 11.72	$ 0.76
Area B - Suburban	$ 7.84	$ 25.58	$ 3.43
Area C - Rural	$ 12.38	$ 30.47	$ 5.78
2W Analog COPTS Coin			
Area A - Metro	$ 2.67	$ 11.73	$ 0.86
Area B - Suburban	$ 8.09	$ 25.78	$ 3.23
Area C - Rural	$ 12.72	$ 30.77	$ 5.95
2W Analog EKL			
Area A - Metro	$ 2.95	$ 11.89	$ 0.80
Area B - Suburban	$ 12.18	$ 29.66	$ 4.34
Area C - Rural	$ 17.92	$ 36.78	$ 7.94
4W Analog			
Area A - Metro	$ 4.08	$ 23.49	$ 1.33
Area B - Suburban	$ 16.82	$ 52.47	$ 6.72
Area C - Rural	$ 26.63	$ 62.95	$ 12.17
Digital Loops			
2W Digital ISDN-BRI			
Area A - Metro	$ 2.71	$ 12.16	$ 1.11
Area B - Suburban	$ 8.88	$ 35.28	$ 3.55
Area C - Rural	$ 13.68	$ 43.43	$ 6.81
4W Digital			
Area A - Metro	$ 73.46	$ 47.42	$ 10.79
Area B - Suburban	$ 61.45	$ 81.96	$ 16.11
Area C - Rural	$ 61.56	$ 116.82	$ 22.34
DS3 Loop			
Area A - Metro	NA	$ 553.53	$ 118.34
Area B - Suburban	NA	$ 672.39	$ 154.06
Area C - Rural	NA	$ 883.53	$ 217.47
xDSL Loops			
2W ADSL/HDSL Compatible			
Area A - Metro	$ 2.59	$ 11.49	$ 1.18
Area B - Suburban	$ 7.07	$ 20.50	$ 3.31
Area C - Rural	$ 11.40	$ 28.95	$ 5.19
4W HDSL Compatible			
Area A - Metro	$ 4.08	$ 22.98	$ 1.33
Area B - Suburban	$ 16.82	$ 40.99	$ 6.72
Area C - Rural	$ 26.63	$ 57.90	$ 12.17
IDSL Loop Access			
Area A - Metro	$ 2.71	$ 12.16	$ 1.11
Area B - Suburban	$ 8.88	$ 35.28	$ 3.55
Area C - Rural	$ 13.68	$ 43.43	$ 6.81

1   As previously stated, the above UNE rates reflect the modifications and inputs from other

2   AT&T witnesses that we have incorporated into our restatement. The revised cost studies

3   producing these modified rates are including as part of our electronic workpapers, which

4   are provided in the "Testimony Figures" directory of Attachment BFP/SET-2.

5   **Q.   DOES THIS CONCLUDE YOUR TESTIMONY?**

6   A.   Yes it does.